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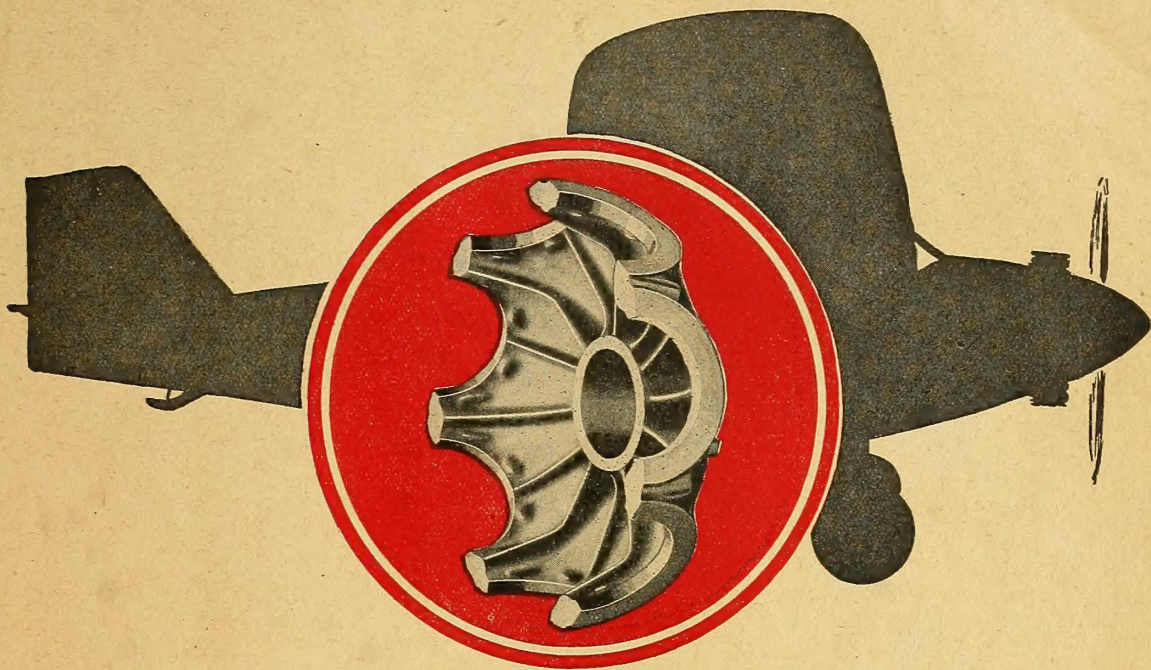


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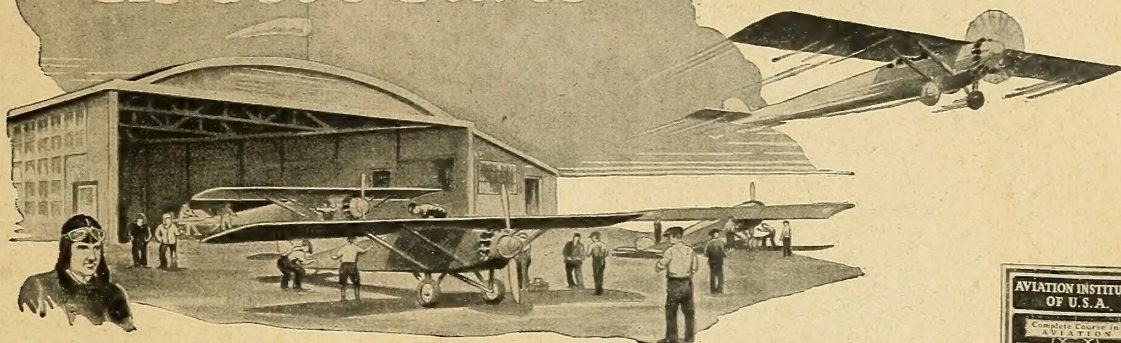
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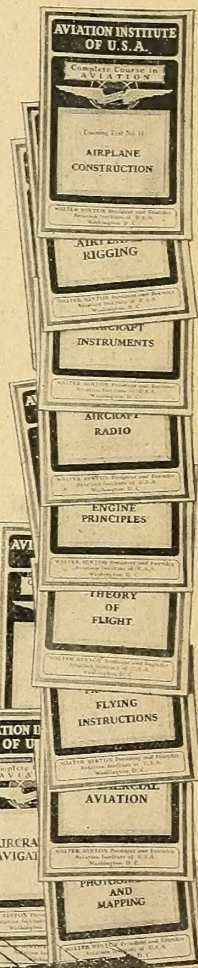
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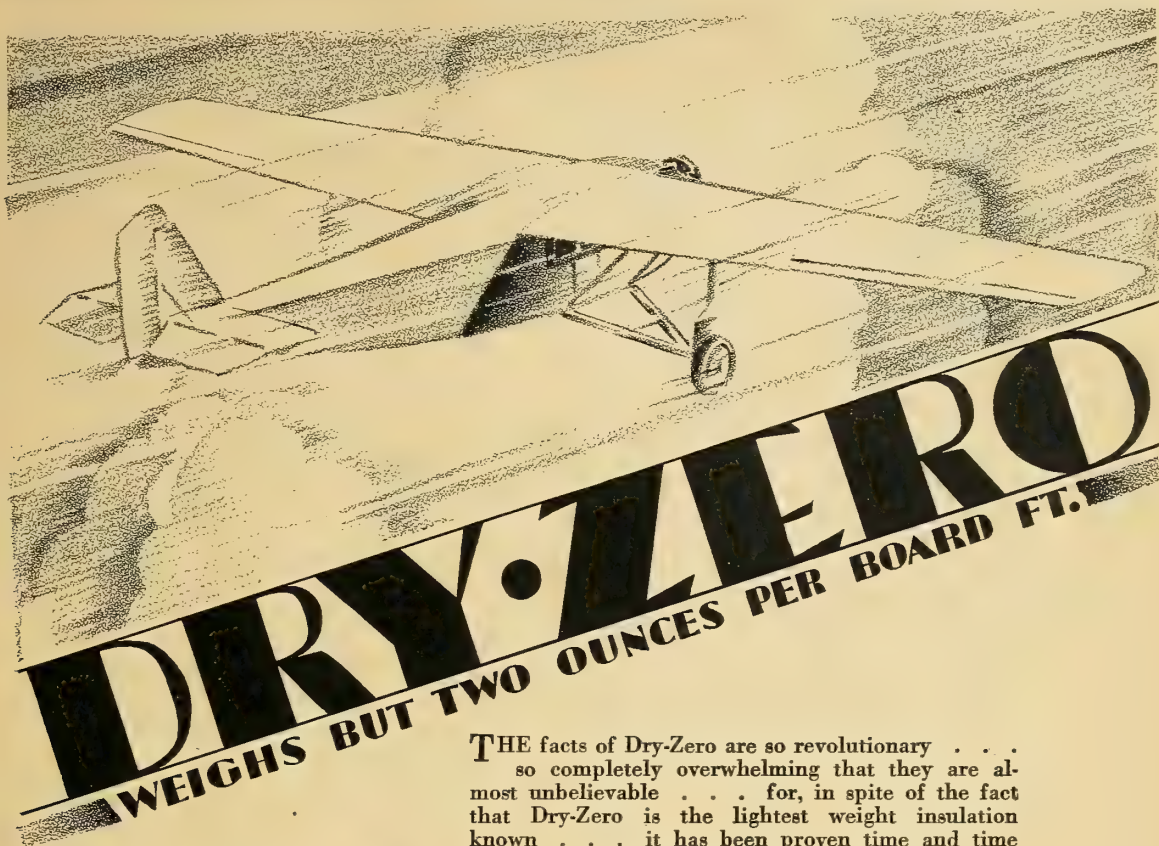
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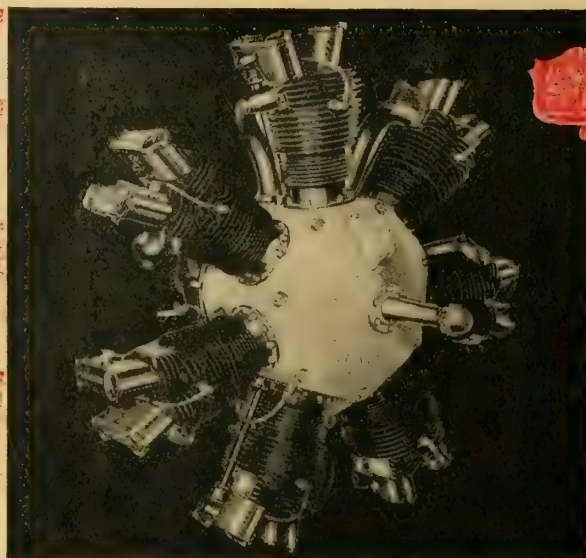
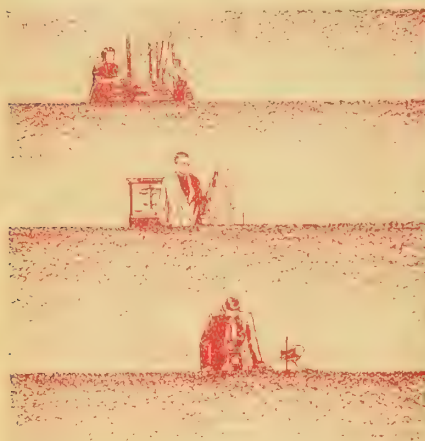
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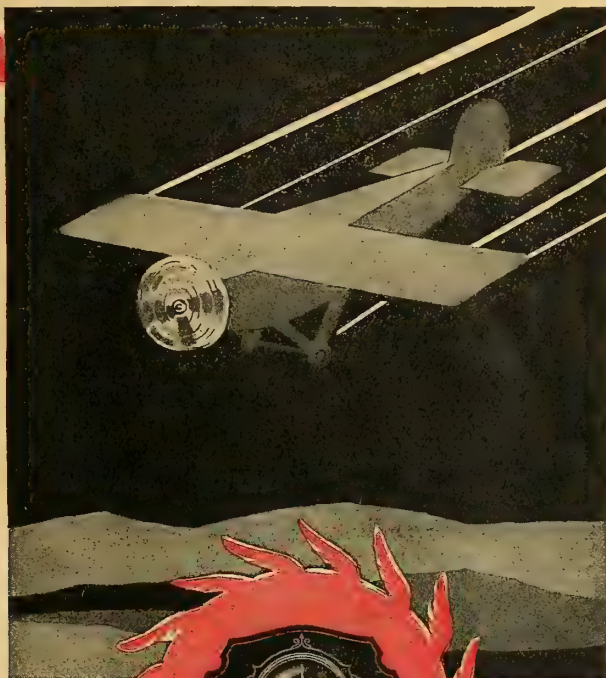
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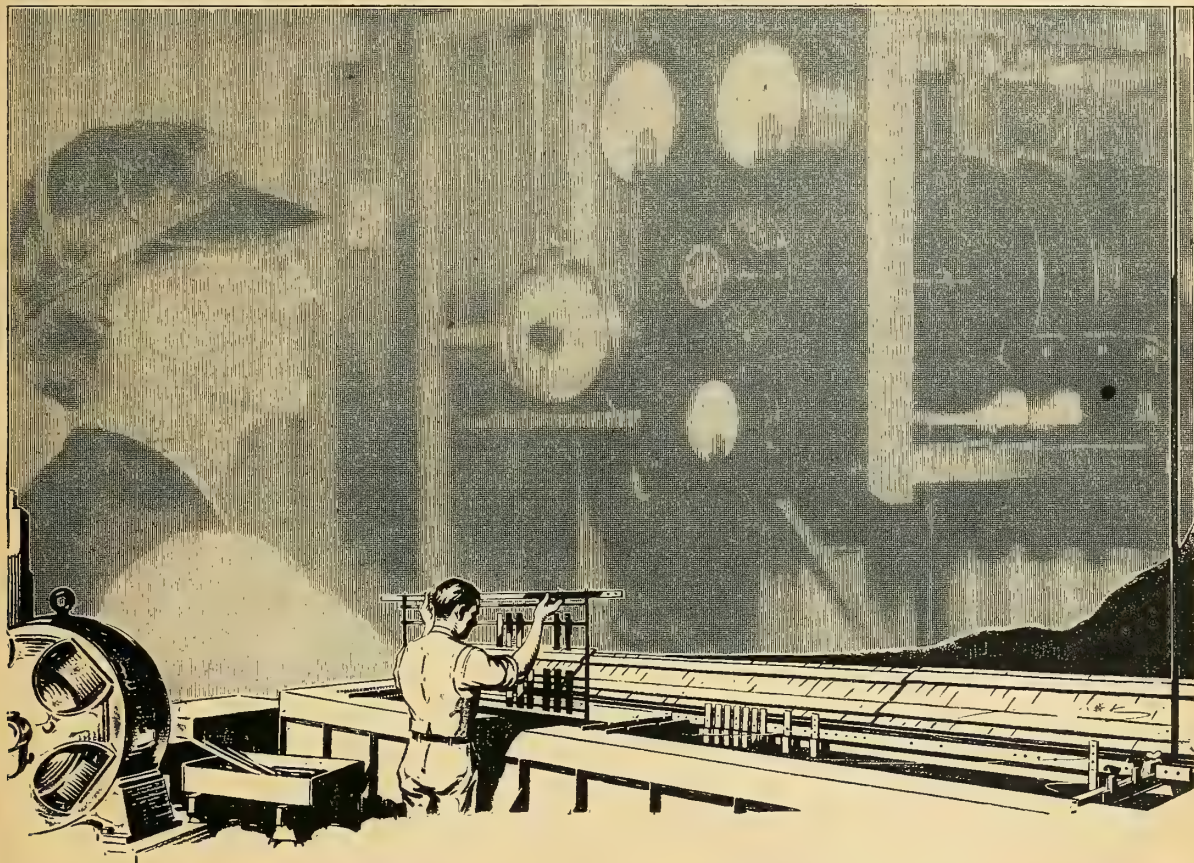
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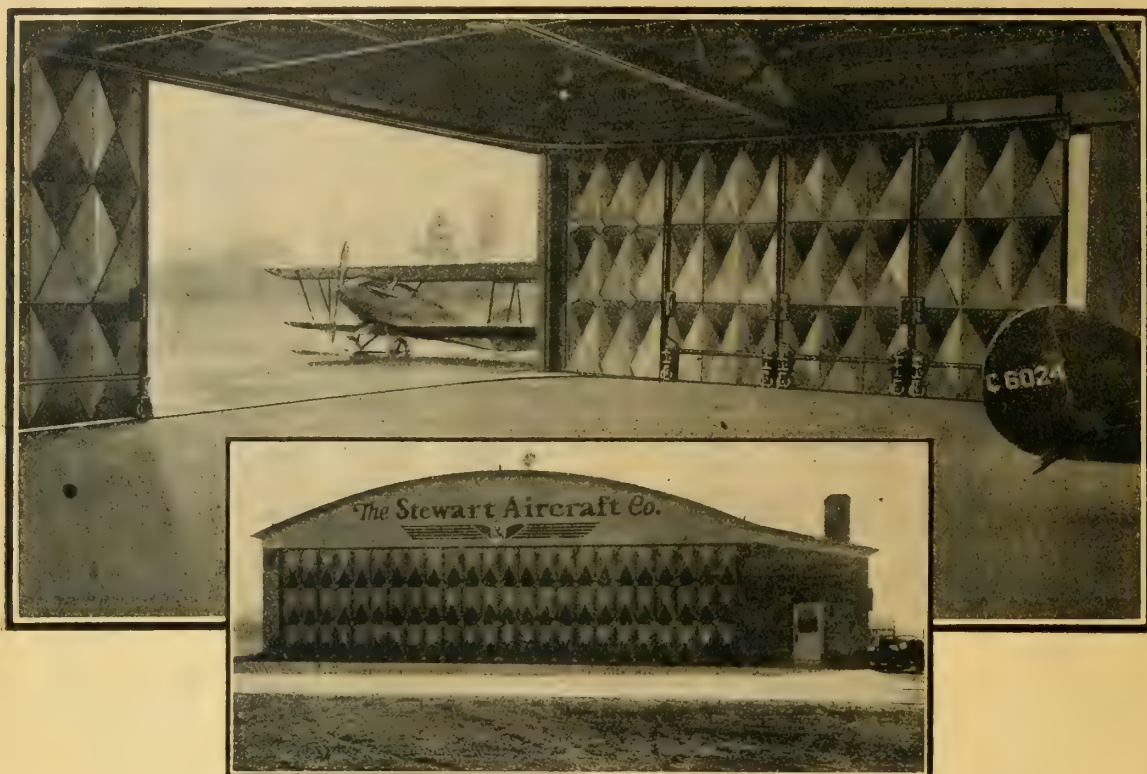
Douglas does not consider the mere application of lacquers to metal as sufficient protection against the

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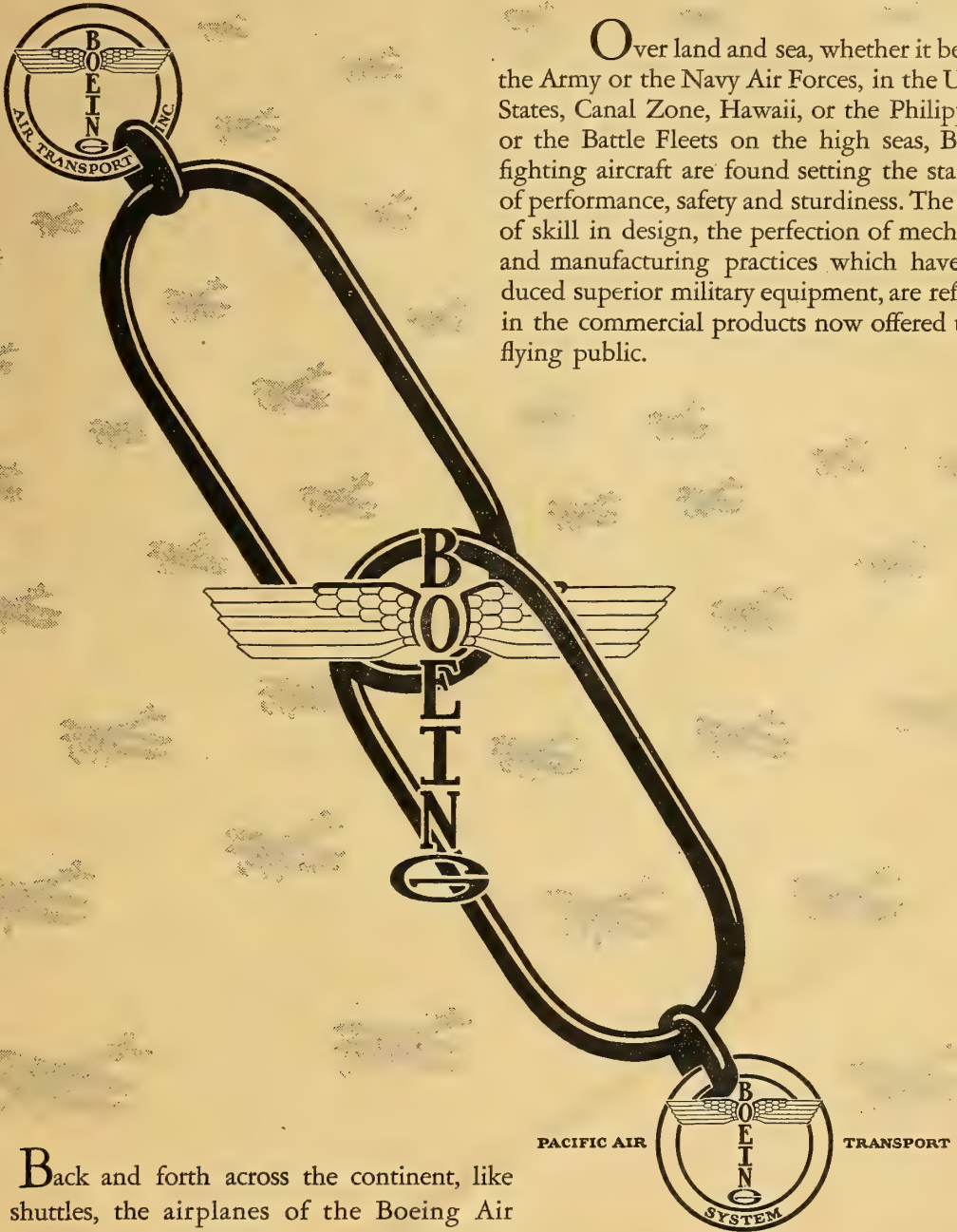
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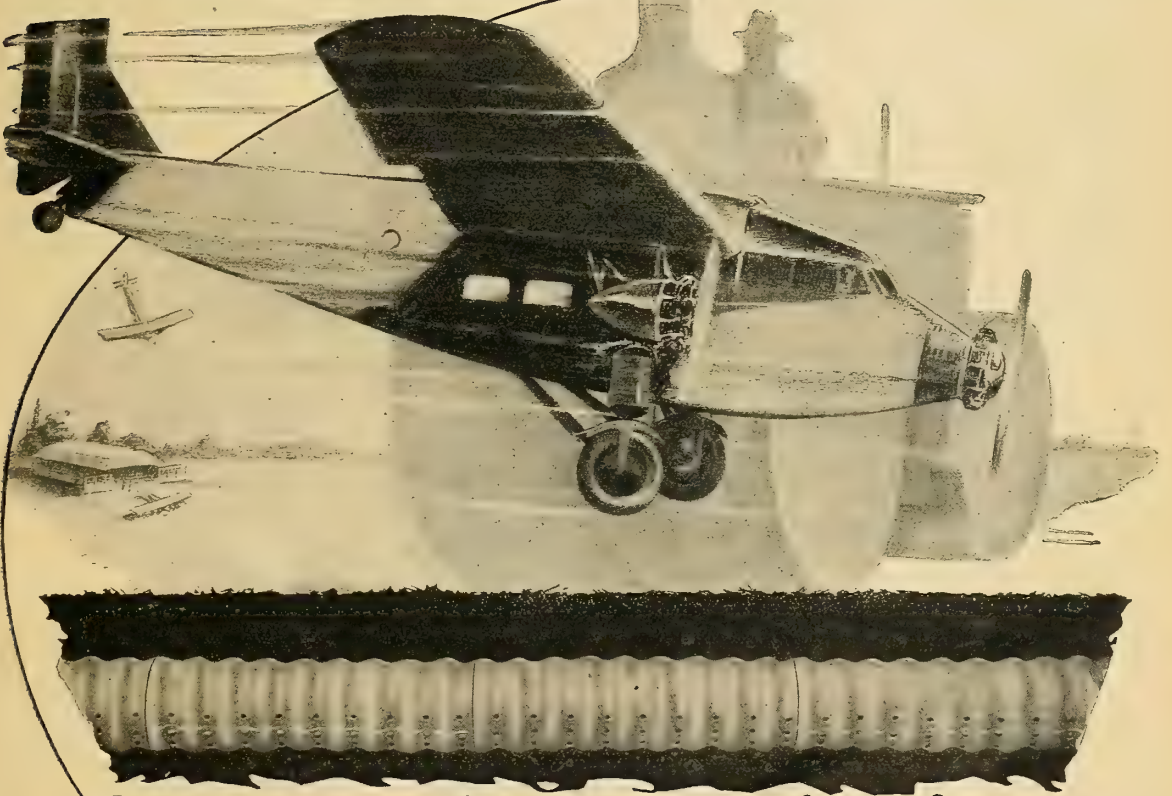


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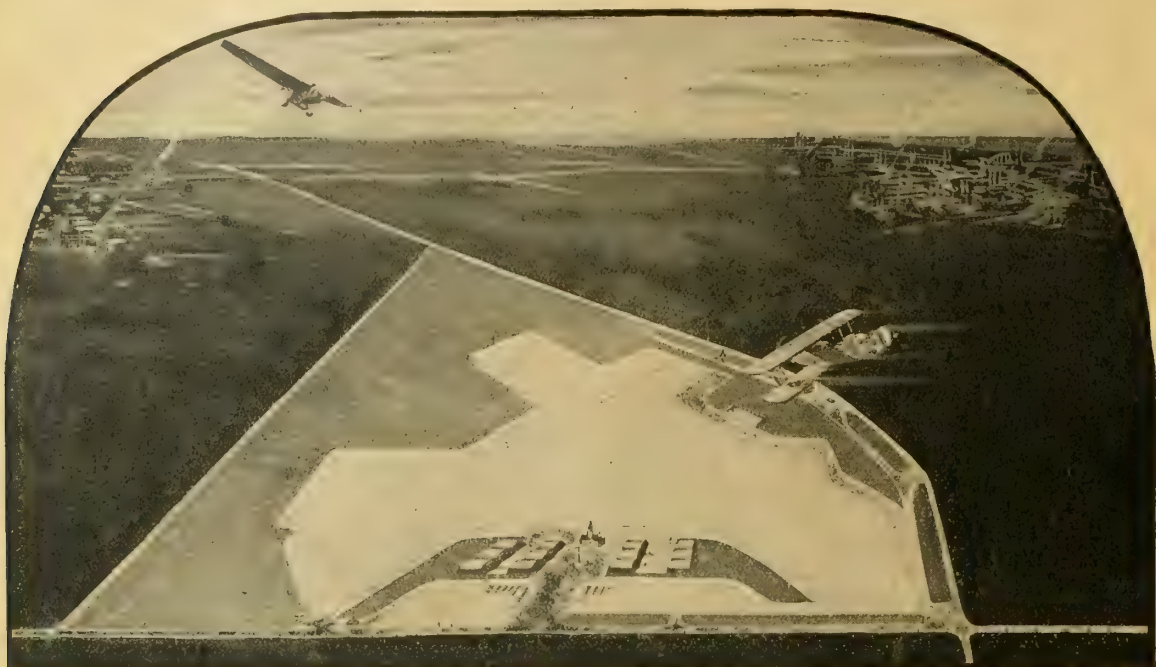
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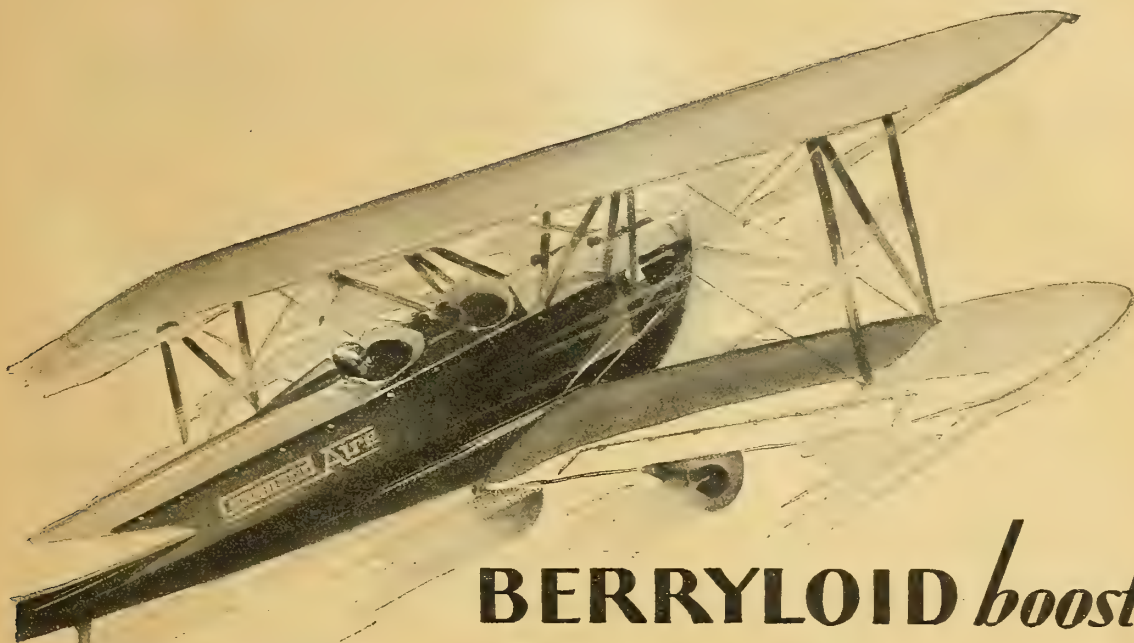
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November 7, 1928

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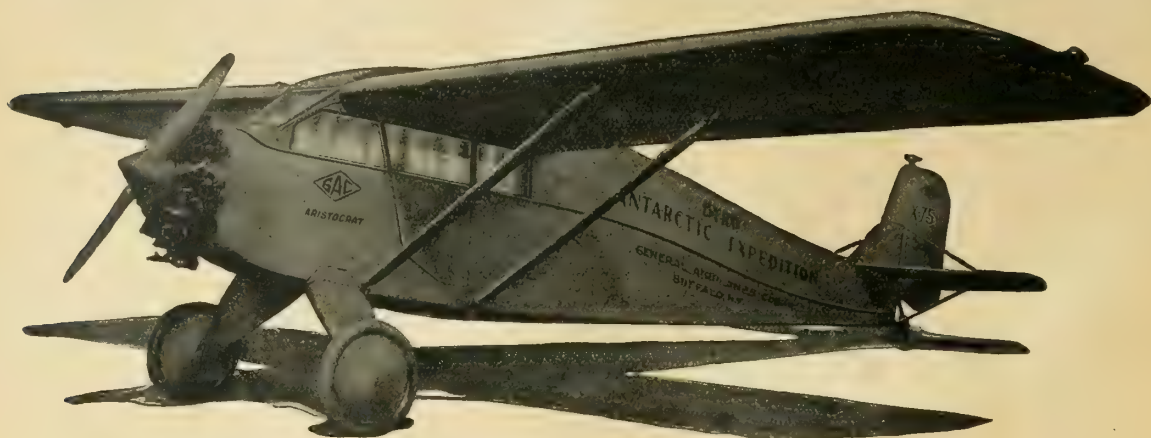
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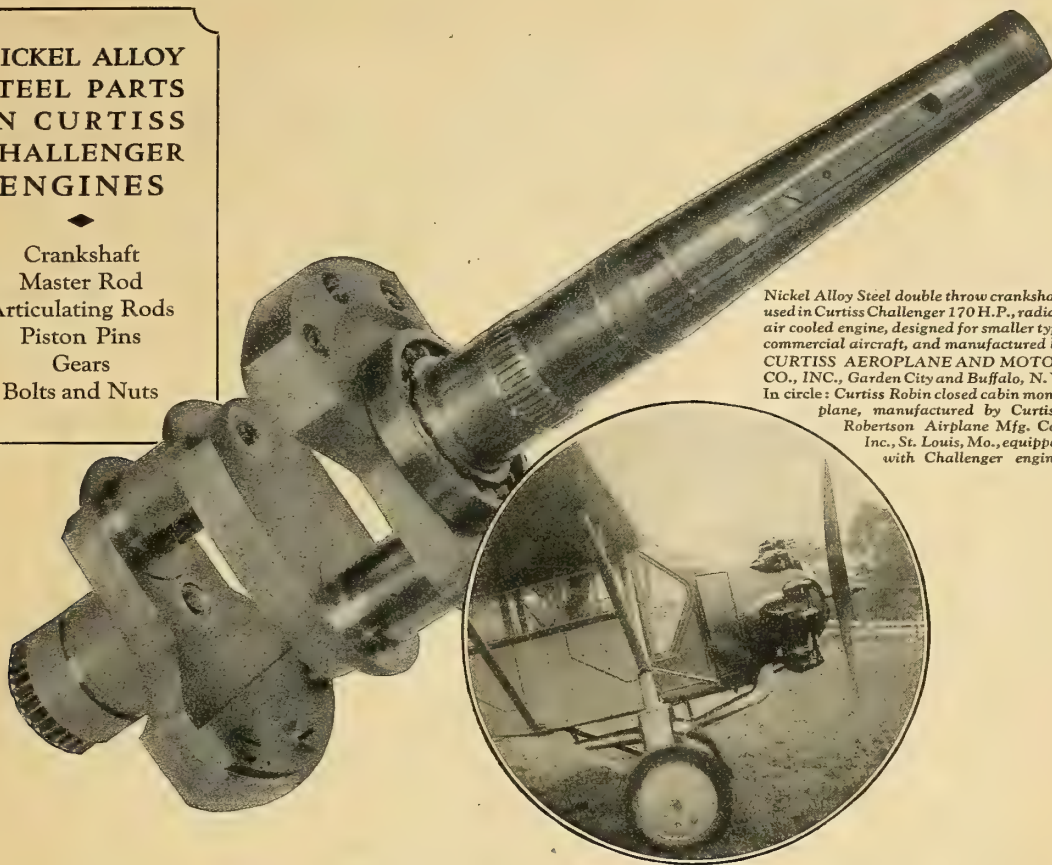


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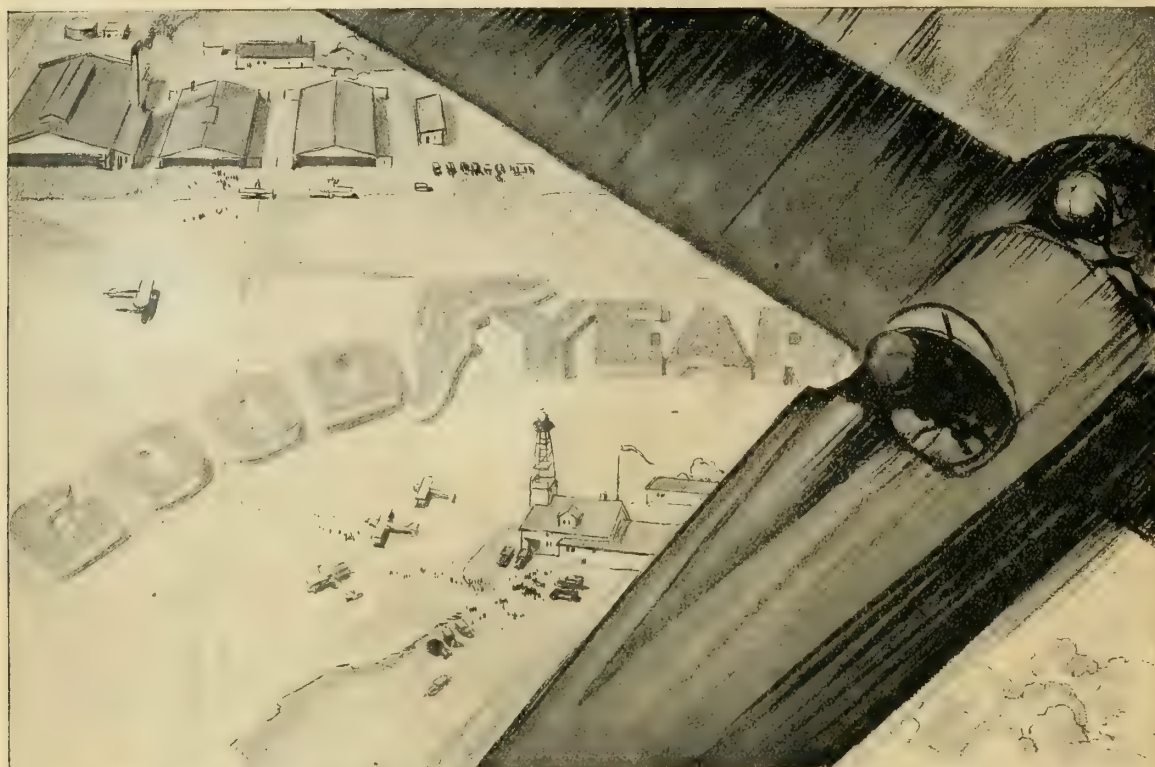
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Span Upper Wing.....	34 ft. 8 in.
Span Lower Wing.....	29 ft.
Total Wing Area (including Ailerons).....	322 sq. ft.
Height.....	9 ft.
Length.....	23 ft. 9 in.
Wheel Tread.....	7 ft. 6 in.

##### *Capacity and Useful Load*

Seats pilot and three. Normal pay- load, 3 passengers, and baggage..	908 lbs.
Weight, empty.....	1,300 lbs.
Total weight, loaded.....	2,208 lbs.

##### *Fuel Capacity Data*

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(2 tanks in upper wings, 21 gals. each).	
Gravity feed through ¾-in. protected piping.....	
Oil.....	4 gals.

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High speed (sea level).....	103 m.p.h.
Stalling speed.....	38 m.p.h.
Cruising speed.....	90 m.p.h.
Rate of climb at sea level (feet per min.).....	750 ft.
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# **CABINAIRE**

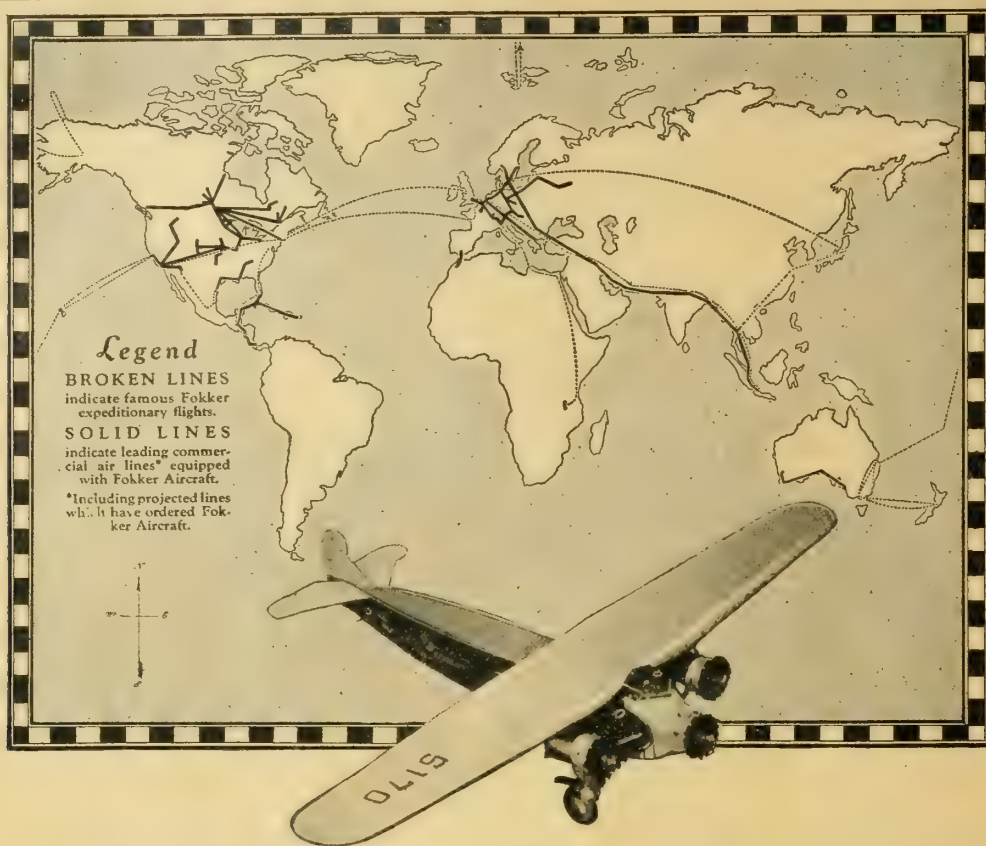
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His unusual experiences and thorough knowledge of every phase of flying give a finish to the students at the Bennett Schools which no amount of artificial instruction could possibly obtain.

THROUGHOUT America, thinking men are turning to aviation, the new industry that has captured public fancy throughout the world. Yet in its infancy, the conquest of the air offers greater rewards to ambitious men than any other calling. Air transport lines are spreading to every point on the continent. Who will fly these ships? Repair them?

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WE ARE building Ford planes more quickly—but not more hurriedly.

We have increased production to three a week. This does not mean less time and attention devoted to each plane. It means that personnel and facilities have been augmented to the point where a greater production of planes can be accomplished with the same care as heretofore.

There was a strong temptation, of course, to increase production long ago. Orders would certainly have warranted it. Nearly every purchaser has had to wait for delivery of his plane—and we wish to express our profound appreciation of their good-humored patience and forbearance. Also of their amazing loyalty to a standard of safety which originally led to their selection of the Ford plane.

But there was a very good reason for our postponing the decision to make the Ford plane in greater numbers. 1926 and 1927 have brought almost incredible progress in

aviation. There was always the possibility of a revolutionary development and improvement in airplanes practically overnight. Though the Ford plane had been designed after a searching look into what the future might bring, it was felt inadvisable to decide arbitrarily that anything was not subject to sudden change. To protect our customers from abnormal obsolescence, we determined to go slow on our building program.

We are convinced that the immediate future will bring refinements of present practices and principles which will make the airplane more efficient, more dependable and more economical. But we expect this change to be an evolution with which manufacturing can keep pace. Consequently we now feel buyers of Ford planes run little if any danger that the planes they buy will become obsolete before they have completed their period of usefulness—a period which we know to be not less than four years. The Stout Metal Airplane Company, Division of Ford Motor Company, Dearborn, Michigan.

Volume 14  
No. 1

# AERO DIGEST

JANUARY  
1929

THE MAGAZINE OF THE AIR

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J. E. Horsfall, Editor.

A. Horsfall, Vice-President.

George F. McLaughlin, Associate Editor.

Contributing Editors: Dr. Michael Watter, Cy Caldwell, Don Rose, Edgar H. Felix.

Cable Address: AERODIG

K. Healy, Secretary.

William A. Rogers, Advertising Manager

### BRANCH OFFICES:

BOSTON: 80 Boylston Street. Henry C. Pragoff, Representative. Phone: Hancock 8915 & 8936.

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*A Ford trimotored transport of the Jefferson Airways which makes two round trips daily between the Twin Cities and Rochester, Minnesota*

# HAPPY NEW YEAR

By Don Rose

I AM beyond doubt or question the world's worst poker player, but it's not for lack of trying. In the little group of serious thinkers who favor me with their company and kind sympathy every alternate Tuesday, I am a sort of benevolent banker, which is a very rare sort of animal to be. Somebody has to lose in every poker game, and my friends count on it to be me. But I keep on trying. Even though I have drawn a few hundred thousand poor, bad or worse poker hands and worn myself out trying to improve upon them, I still pick up the next deal with undiminished hopes and expectations.

In the same cheerful and trustful spirit I open the door to each New Year as it toddles down the highway of time. I forget the bumps and bruises of the last one and all its sour grapes and thistles, and welcome the incoming caravan of new experiences, all of which I expect to be all wool and a yard wide. So, it seems, does everybody else. None of us hold spite for long. On the thirty-first of December we wash up the past and welcome the future with a lot of new and reconditioned good resolutions and enough optimism to break the altitude record with a battleship.

Among the mixed motives and emotions of humanity, this spirit of optimistic good intention is, perhaps, the most valuable. It's the outward and visible sign of the secret mainspring of human life, the drive from within, whose real and final purpose is known only to the power that put it there. It is the sole secret of progress, and it makes every new year a new adventure and every old one a toe-hold for more climbing. And so—a Happy New Year to everybody!

For that matter, the old year didn't treat us so badly. As far as the present scribe is concerned, it was a year of surprises and excitements. None of the things I expected happened, and a lot of things happened that nobody could have expected. As far as our favorite trade or profession is concerned, the old year could hardly have held more without splitting at the seams. The whole tone and temper of aviation and all its programs, prospects and possibilities have changed since a year ago last Tuesday. Then it was an infant industry, squawking a good deal as infants do, and—according to some people—hardly worth the trouble of raising. Today it's a young two-fisted giant with a place in the sun and the stock market, and all the prophets of gloom have come around now to say "I told you so." Yes, the world do move.

The most interesting prospect of the new year is that aviation now has a real chance to work for its living. There has been a lot of spade work done during the past year, and a large share of it was done where it was most needed,—on airports and landing fields. It's not all done yet, but to some extent the country has caught up on the technical development of the plane and the proficiency of the pilots. An enterprising airplane now has lots of places to go, and there is an increasing number of people who want to go there. This is not a matter of statistics, though the statistics are lying around somewhere if you really want them. It is a matter of ordinary observation and reading of the newspapers. The plane has been ready for business for some time, but now the business is ready for the plane.

We are on the second lap of the education of the dear old public. The old gag about making people "air-minded" is worn thin, and we might as well chuck it away and get a new one. This first-grade course has been expensive,—

expensive in money and in men,—but it has been well done. A survey of the country's airports, and particularly the

ones that have come into being during the past year, shows that sensible people are now taking this business seriously, and from now on it's simply a matter of the natural spread of the gospel. Even good sense is infectious and competition is very good for trade. The fact that there are over 1,300 good airports in the country means that there will soon be a lot more of them.

We are tempted to take stock at the close of one year and the beginning of another. I don't care to do so personally, since I always discover the same thing,—that I have made more money than I thought and spent more than I should, and that my net balance in the bank is 49 cents. But a business house prepares a balance sheet for the good of its own soul and the comfort of its stockholders, and tries to show a profit for the year. Aviation can show a profit for 1928. Perhaps it isn't in the bank nor in negotiable form, but it's there. Its gains take the form of what the accountants call "deferred profits,"—profits actually earned though not yet collected. By sticking closely to business, by doing a good job when there was a job to be done, by facing problems, risks, and all the challenges of the unknown, the industry has earned the confidence of the country and the right to its share in the country's business. More than that, it has built up—on something very much like a shoe-string investment—a tremendous new industry, capitalized in figures that can only be handled intelligently by an adding machine. And it has done a rather ingenious stroke of business in persuading other people to put up the money. Through the educational work of last year, much of which was done without ballyhoo and simply as part of the business foresight of manufacturers and operators, the public itself has taken a big stake in the future of the industry. City councils, who normally part with money as readily as I part with a favorite tooth, have become positively prodigal and big-hearted. Citizens have cheerfully dug deeper for taxes in order that the home town shall get on the air map. It's a perfectly elegant condition of affairs, and some day people will wonder how it was done.

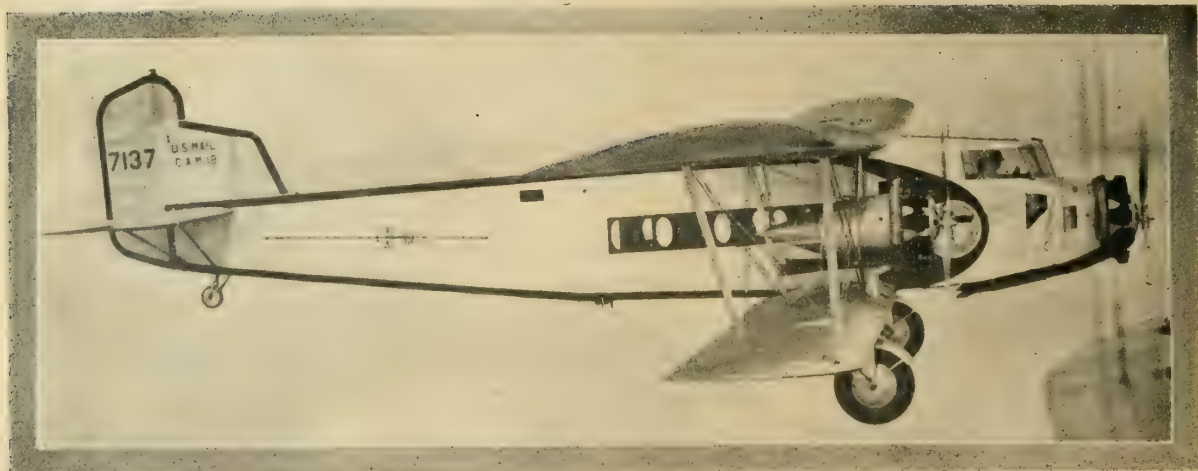
So for a first New Year Resolution we will agree to worry no more about making people "air-minded." Those that have minds are that way already, and the rest don't matter.

For a second we might agree to put a gentle damper on the talk about the "romance of a pioneer industry." Romance is good bait but a poor steady diet. The romance of aviation served very nicely to fatten the enrollments of flying schools when other inducements were a little scarce; it helped the hardworked short-story writers to keep out of the poorhouse; it has given the comic-strip artists a new chance to make pretty pictures of things that aren't so. But the industry is about ripe and ready for graduation from the romantic age. Aviation is a bread-and-butter business for everybody in it, and even the public can now swallow the fact without blinking.

This is not to say that there will be no more romance under the hard shell of realities. There's romance in every trade,—in bookbinding, bootlegging and barbering, in ditch-digging, dredging and deep-sea diving. There is even romance in tending the furnace twice a day and three times on Sunday, though it runs a little thin on a sub-zero night about 11:30 when the coal-pile is down to its last gasp. There is romance

(Continued on page 176)





*Boeing Air Transport twelve-passenger trimotor transport in flight over San Francisco Bay.*

# AIR TRANSPORTATION

By  
William E. Boeing

THE story of air transportation in America goes back almost to the first pioneering flights of the Wrights. No sooner had man acquired the power of artificial flight than the more adventurous of our citizens demanded an opportunity to fly as passengers. As soon as the inventors produced airplanes equipped to carry the pilot and a passenger, air transportation became a possibility. Comfort, safety, everything was cast aside in the desire to leave the ground and feel the thrill of flying. However, the general public did not take kindly to the idea of flying as passengers but were more than willing to watch "dare-devil aeronauts" perform for their amusement, and it was many years before air transportation became a practical reality.

The early days of aviation have been recalled by numerous writers, and the story up to the time of the World War is pretty well known. Flying was very much in the pioneer stage and was useless as far as the masses were concerned, except as a curiosity. The War made aviation a reality, demonstrating to the millions who took part with our expeditionary forces that the airplane could be made to carry useful—and dangerously powerful—loads. The French were the first to make peaceful application of this lesson.

In the spring of 1919, in Paris, Farman bombers were converted into passenger planes, and sight-seeing tours over the battlefields were offered to the public at very reasonable prices.



Thus began the commercial use of the airplane for passenger traffic. The success of this operation made it apparent to observers that transportation between definite stations for business purposes was entirely feasible. Before the end of 1919, the British had converted some of their bombing planes and announced a regular service between London and Paris. At the same time, the Germans adapted one of their dirigibles, the Bodensee, to commercial service and were carrying passengers from Cologne to points on the upper Rhine.

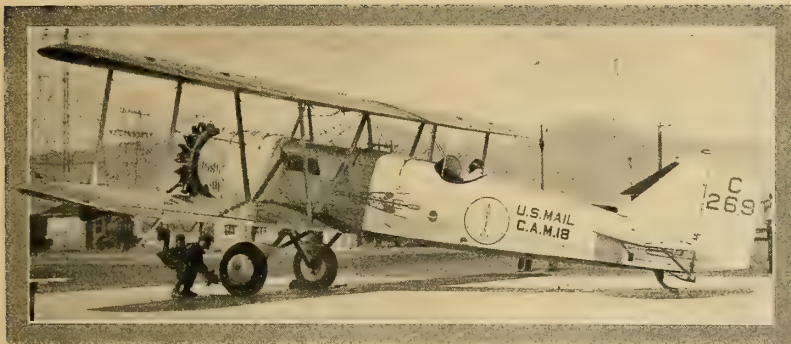
The United States Army Air Service pioneered the way in this country when it converted a Martin bomber into a transport plane, which operated between military stations for several years. The well known Fokker T-2, in which Lieuts. Macready and Kelly made the first transcontinental non-stop flight, was originally sold to the army as a transport plane. The Army Air Service also pioneered in the field of established airways and opened a regularly scheduled operation between Dayton, Ohio, Washington, D. C., and New York City. Along this route landing fields were obtained, and towns and cities marked for identification from the air.

While our military services were experimenting in the transportation of passengers, our Post Office Department was establishing what is the real foundation of American air transportation. The first air mail route between Washington and New York City, although not a great suc-



*Loading American Railway Express*





Ready for take off from Salt Lake City on the eastbound route

cess in itself, showed the possibilities of aerial mail service, and the New York-Chicago line was inaugurated. The growth from these small operations to the vast network of contract air mail routes of today is familiar to all: 218 miles of operation in 1918, 12,584 miles in November, 1928, 17,890 miles to be operating early in 1929.

The steady growth of the air mail poundage and the extension of the service by the government and by commercial air mail contractors indicated that the public was becoming air-minded, but it took the exploits of Colonel Lindbergh, Commander Byrd, and others to focus attention on the possibilities of air travel. Even today there are thousands, if not millions, of business men who do not know of the time saving available to them through the use of airplane transportation which is actually established and operating on regular schedules between practically all of the important centers of commercial activity.

In the spring of 1927, the Government announced its intention of offering certain air mail routes to commercial contractors. The Boeing Airplane Company saw in this offer the opportunity to obtain the finest laboratory in the world for testing and improving its products, combined with Mr. Ed. Hubbard, the operator of the oldest contract air mail route in the United States, and submitted its bid for the transcontinental route between Chicago and San Francisco. Between the signing of the contract in February and the first day of July, the Boeing Airplane Company designed, constructed and placed in service twenty-five mail planes; especially adapted to this route and operation. These mail planes have now flown more than 2,000,000 miles over the plains of the Middle West, the mountains and deserts of Wyoming, Utah and Nevada, the timbered slopes of California, operating from landing fields at sea level and at 7,200 feet elevation in Wyoming, through fogs, snowstorms and sleet, at 45 degrees below zero and 120 above, day and night,—and through all these

circumstances have maintained a remarkable record for regularity and safety.

When these airplanes were laid out, a small cabin was provided to permit the movement of mechanics from one station to another over our 2,000 miles of operation. Before the planes had been in operation two months, the demand for emergency transportation of the passengers made it apparent that public service was a necessity, and regular passenger tickets were made available. At that time, certain other operators were carrying emergency passengers, but almost without excep-

tion, open type equipment was used and the passenger rode with the mail in an open cockpit. In a very few months it became apparent that our passenger service would amount to a real volume if improved accommodations were offered. A contract with the Boeing Airplane Company was therefore placed calling for four transports capable

of carrying twelve passengers with their baggage, plus twelve hundred pounds of mail. These transports are now in service carrying mail between Chicago and San Francisco. Due to the great increase in air mail loads, it has been impossible to expand equipment fast enough, and for the time being, the transports are reserved for that service alone in anticipation of the Christmas loads. In the meantime new mail planes are coming through the factory, and the transports will be placed in regular passenger service shortly after the first of the year. At the same time, our pilots are becoming familiar with the operation of these trimotored planes, a policy strictly followed on our line.

Our transports offer the utmost in safety and comfort. The twelve passengers are provided deeply upholstered adjustable seats, individual reading lights, cabin instruments which tell the altitude, air speed and time, lavatory with hot and cold water, and a buffet service from which coffee, soup, and lunches may be served by the steward. The cabin is 73½ inches in height, one

(Continued on page 172)



Boeing mail plane over Ruby Mountains, Nevada



The Boeing 40-A mail plane at Oakland Airport



# THE AIR SHOW AT CHICAGO

**M**ORE than 70 complete airplanes and a score of engines were exhibited at the International Aeronautical Exposition at Chicago from December 1st to 9th. Besides the airplane and engine exhibits the industry was completely represented by displays of accessories, instruments, materials and other products directly related to aircraft. Since the show was primarily a commercial display, the only military planes shown were the big Keystone bomber and a Vought Corsair.

The principal display was made at the Coliseum building, in the central hall of which 35 airplanes were grouped. Around the sides of the central hall were exhibits of airplane engines. In the north hall adjoining the Coliseum were 11 airplanes, and in the south hall there were 9 planes on exhibit. The space was so crowded that it was necessary to display some of the airplanes in an armory near the Coliseum. In this building there were about 18 airplanes.

The accessories and exhibits other than airplanes and engines were displayed in booths. These were on the first floor of the Coliseum building, arranged around the sides of the main hall and completely filling the first floor of the north and south exhibition halls adjoining.

Many of the airplanes and products publicly displayed were seen for the first time on this occasion. Although most of the exhibits were of products well known to the

industry, they were of educational interest to the less initiated. Since the airplanes were the main features of attraction, a summary giving an idea of the extent of this display should be of interest. The following planes were exhibited in the main hall of the Coliseum:

Fairchild Airplane Mfg. Corp., Farmingdale, L. I., N. Y. Three new Fairchild planes were shown for the first time. These were the Model 71, a 7-passenger cabin monoplane with a Pratt & Whitney engine; the Model 41, a 4-passenger cabin monoplane with a Whirlwind engine; and the Model 21, a low-wing training monoplane powered with a British Armstrong "Genet" engine. Besides the airplanes shown, the Fairchild Airplane Manufacturing Corp. displayed a miniature reproduction of the Fairchild airport, Farmingdale, L. I.

The Moth Aircraft Corp., New York City. The 2-seater Gipsy Moth with the 85-100 h.p. air-cooled Gipsy engine was displayed.

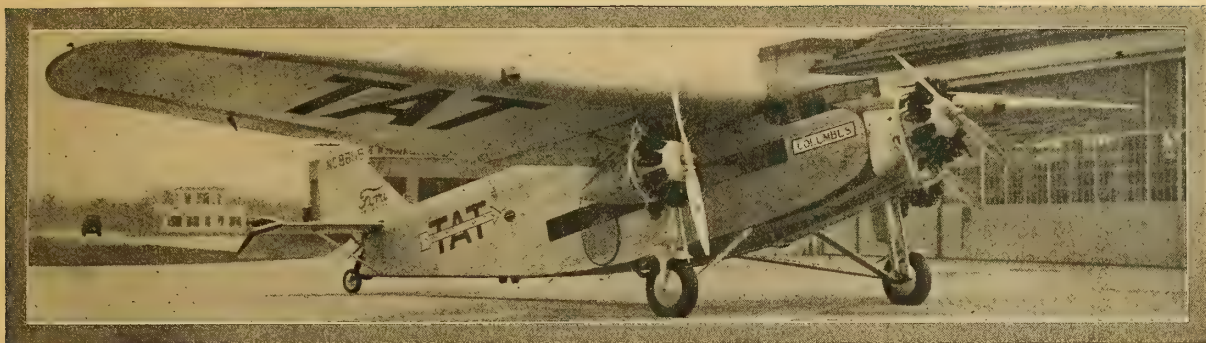
The 2-seater Avro Avian, formerly owned by Lady Heath and now owned by Amelia Earhart, was shown. This plane was one of the few historical exhibits.

Fokker Aircraft Corp., Hasbrouck Heights, N. J. Two Fokker airplanes were shown. These were a Super-Universal and the new amphibian, which was exhibited for the first time. Both planes are powered with Pratt & Whitney



A general view of the Chicago Coliseum showing some of the planes at the aircraft show last month.





The Transcontinental Air Transport's Ford Trimotor attracted thousands of visitors at the show.

engines. The Fokker exhibit included models, such as miniatures of the record-breaking plane of Kelly and Macready, which established the first non-stop record across the continent, and the *Josephine Ford* used by Bennett and Byrd on their flight over the North Pole.

Szekely Aircraft Corp., Holland, Mich. The "Flying Dutchman" is one of the smallest practical planes in production. It is a single-seater and is powered with a 3-cylinder Szekely engine. This company also displayed a complete airplane of the same type entirely uncovered so as to show the skeleton framework.

American Eagle Aircraft Corp., Kansas City Mo. Three types of planes were shown by the American Eagle,—an open-cockpit biplane powered with a Kinner engine, a cabin monoplane with a Whirlwind engine and the Model A-429 "Flyabout," a light two-place sport biplane with

The Transcontinental Air Transport Co., New York City. The first of a series of transcontinental passenger airplanes was exhibited. This plane, a Ford trimotor, equipped with three Pratt & Whitney engines is the latest development of the Ford Company. It is provided with two sleeping berths, one above the other at the rear of the cabin, adjustable chairs, typewriter desk, typewriter and office equipment and appointments designed to promote comfort on long flights. This plane will be flown by John Collings, chief pilot of the T.A.T., as an experimental plane to determine what changes are desirable for the regular passenger planes which are to follow. The T.A.T., also displayed flight photographs of their plane *Columbus*, and a revolving beacon.

Stinson Aircraft Corp., Northville, Mich. Two Stinson monoplanes were shown. The 4-seater Junior type with a Warner Scarab engine and the 6-seater Stinson-Detroit with a Whirlwind engine. A large drawing was shown of the new Stinson factory which is to be ready for occupancy in a few months.

Curtiss Flying Service, Inc., Garden City, L. I., N. Y. Three airplanes were shown by Curtiss,—a Curtiss Robin with an OX-5 engine and one with a Challenger engine, and a big Sikorsky Amphibion deluxe with twin Pratt & Whitney engines. The Challenger Robin is provided with the new Eclipse starter which may be operated by a crank handle from the cabin, this being the first installation of the new starter. The Sikorsky Amphibion was one of the most attractive planes at the show, the luxurious interior of the boat-hull being arranged in a most attractive and comfortable manner. The landing gear on this plane is operated by means of compressed air.

Advance Aircraft Co., Troy, Ohio. The tapered-wing sport Waco powered with a Whirlwind engine, suspended from the ceiling of the Coliseum, gave the spectators an opportunity to view this plane in flying position. Beside the suspended plane, another of the same model was shown on the floor, as was the more familiar Waco-10 powered with an Hispano engine.

Hall Aluminum Aircraft Corp., Buffalo, N. Y. The



The Mercury "Kitten" with wheel-ski landing gear.

folding wings having a LeBlond engine. Besides these planes, the company also displayed a training plane at the Sherman Hotel and a custom-built twin-motored cabin monoplane at the Franklin show room on Michigan Avenue.

Bellanca Aircraft Corp. of America, Newcastle, Del. The model CH cabin monoplane with a Whirlwind engine was shown. Trophies won by Bellanca planes were also exhibited.

Mono Aircraft, Inc., Moline, Ill. Three monoplanes were shown:—the 2-place Monocoupe with 5-cylinder 62 h.p. Velie engine, the open cockpit 2-place Monoprep with a 5-cylinder Velie engine, and the new 4-place Monocoach with a 9-cylinder Velie engine.

B. F. Mahoney Aircraft Corp., St. Louis, Mo. The display included the well-known Ryan B1 and the new type Ryan B3, both powered with Wright J-5 engines.

Hamilton Metalplane Co., Milwaukee, Wisc. The all-metal 8-passenger cabin plane model H45 powered with a Pratt & Whitney Wasp engine was exhibited. This company also displayed one of its metal floats.

Stout Metal Airplane Co., Dearborn, Mich. This division of the Ford Motor Company displayed one of the Ford trimotor metal monoplanes powered with three Whirlwind engines. This particular plane is owned by the Independent Merchants and is fitted out as a "flying grocery store" with canned and packaged merchandise.



The Command-Aire on display in Chicago.





The J. B. S. light plane for instruction work.



Siemens-Halske exhibit imported from Germany.

skeleton framework of an all-metal single-seater pursuit airplane was exhibited to show how well the structure withstood long usage in service. This uncovered plane also served to reveal the working mechanism of a military airplane.

Keystone Aircraft Corp., Bristol, Penn. The Keystone Pirate Bomber, LB5A, powered with 2 Liberty 425 h.p. engines was shown. This Bomber was provided with full military equipment including machine guns and bombs. The Keystone Loening commercial cabin amphibian with a Wright Cyclone engine was also on view. The cabin of this biplane is provided with comfortable accommodations for seating four persons.

Chance Vought Corp., Long Island City, N. Y. The Wasp engined Corsair used by Admiral Moffett, U.S.N., was displayed through the courtesy of the Navy Department. The beautiful finish of this airplane, which is one of the regular stock models, was the source of much admiration to the thousands who inspected it. The Vought



Nicholas-Beazley's exhibit of accessories.

corporation also showed one of the main floats and a wing float as used to convert the Corsair from a landplane to a seaplane.

Travel Air Mfg. Co., Inc., Wichita, Kans. The well-known Travel Air biplane with a Whirlwind engine was shown. This plane is operated by the Dixie Davis Flying Field, Inc., of Cincinnati, Ohio. The newer Travel Air

type 6000 cabin monoplane with a Whirlwind engine, also owned by Dixie Davis Flying Field, was displayed by the Travel Air company.

Boeing Airplane Co., Seattle, Wash. This company displayed the only flying boat at the show. This was the model B-1E powered with a Pratt & Whitney engine. The cabin accommodations and appointments in this 4-seater are carried out to a high degree of perfection. The hull is of natural finished mahogany plywood. The Boeing company also displayed models and photographs of their products and activities.

In the north hall the following airplanes were shown:

Stearman Aircraft Co., Wichita, Kans. Stearman mail plane C-3MB with the Wright Whirlwind engine, and a Stearman C-3BDE DeLuxe with a Whirlwind engine.

Pitcairn Aircraft Inc., Bryn Athyn, Penn. Besides a skeleton fuselage of a Super Mailwing, a complete Super Mailwing was shown. This is the new type PA6 powered with a Whirlwind engine.

Aeromarine Klemm Aircraft Corp., Keyport, N. J. The low-wing Klemm monoplane powered with a 9-cylinder Salmson engine was an exhibition. One of the Aeromarine Klemm planes was flown at the airport where demonstrations were made daily.

Consolidated Aircraft Corp., Buffalo, N. Y. Two of the Consolidated Husky Juniors with Warner Scarab engines were displayed.

Kreider-Reisner Aircraft Co., Hagerstown, Md. A Kreider-Reisner Challenger powered with a Comet engine was on view.

Alexander Aircraft Corp., Colorado Springs, Colo. The Hispano engine Eaglerock was shown.

Buhl Aircraft Co., Marysville, Mich. The new Buhl Senior powered with a Wright Cyclone engine and the Buhl Sport powered with a Whirlwind engine were included in this display.

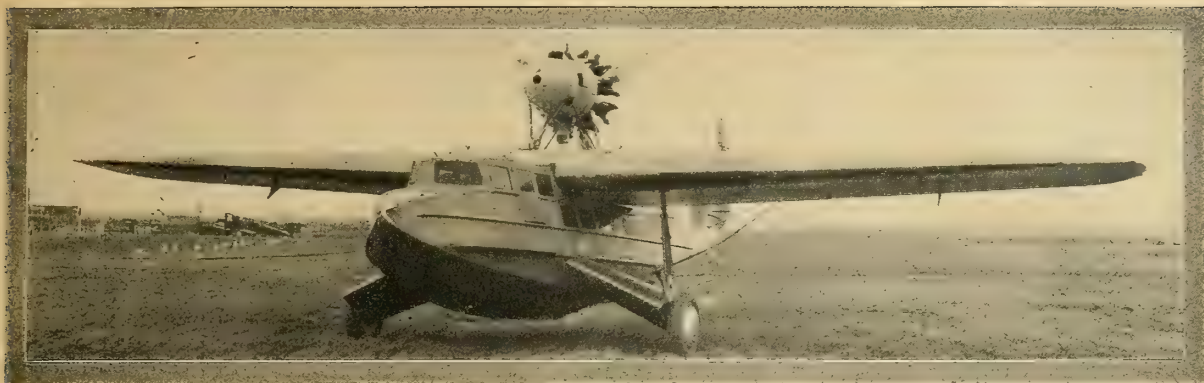
In the south hall were the following airplanes:

General Airplanes Corp., Buffalo, N. Y. The Aristocrat cabin-plane powered with a Warner engine was shown. This plane, designed for a pilot and 2 passengers, is simi-



The Fairchild 71, a seven-seater, made its initial appearance at the show.





The Fokker Amphibian monoplane was shown for the first time at the Chicago show.

lar to one being used by Commander Byrd on his South Pole exploration trip. The General company also showed a collection of models.

Swallow Airplane Co., Wichita, Kans. Three Swallow planes were exhibited, one powered with an Axelson engine, one with a Whirlwind engine and the TP training plane powered with an OX-5 engine.

Spartan Aircraft Corp., Tulsa, Okla. The Spartan powered with a Walter engine and a skelton fuselage were displayed.

Gates-Day Aircraft Corp., Paterson, N. J. The Hispano motored New Standard GD-24 (a 5-passenger plane), and a skeleton fuselage showing the open channel and angle construction of the all-metal fuselage framework made up the Gates-Day exhibit.

Cessna Aircraft Co., Wichita, Kans. The 4-place cantilever cabin monoplane with a Warner engine and the new model CW6, a new 6-place cabin plane powered with a Whirlwind J-5 engine, were on exhibition.

In the Greer Building adjoining the Coliseum the following planes were exhibited:

Stinson School of Aviation, Detroit, Mich. The Stinson School showed the JBS Air Coupe powered with a Le Blond engine. This is a single-seater cabin plane.

Star Aircraft Co., Bartlesville, Okla. The Star Cavalier cabin plane powered with a 5-cylinder Velie engine was on view.

Capital Aircraft Corp., Lansing, Mich. The Air Trainer 2-place tandem parasol monoplane with a 60 h.p. LeBlond engine made up the Capital exhibit.

Phantom Knight Aircraft Co., Oak Park, Ill. The Model 1, an OX-5 engined 3-seater biplane, was displayed. All metal parts of this plane are rust-proofed to prevent corrosion.

Monarch Aircraft Co., Riverside, Ill. This company also showed an all purpose OX-5 open cockpit dual control biplane.

In the Armory near the Coliseum building, there was more room to display the airplanes, although this building was never as crowded as the main building. Consequently, it was possible to view the exhibits here to better advantage. The following companies exhibited in the Armory:

Aire-Kraft, Inc., Washington, Penn. The De Lloyd monoplane powered with a Velie engine was shown. The De Lloyd derives its name from Mr. De Lloyd Thompson,



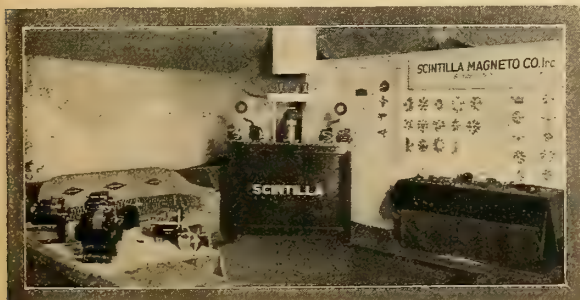
The Bellanca CH with Whirlwind engine.

who is one of the pioneer exhibition fliers in this country, and now sales manager for Aire-Kraft, Inc.

Arrow Aircraft & Motors Corp., Havelock, Nebr. The LeBlond engined Arrow sport plane, which is designed to have the non-stalling features claimed for the slotted wing, was displayed.

Butler Aircraft Corp., Kansas City, Mo. The Butler 4-place cabin airplane was shown. This plane is powered with a Whirlwind engine.

Great Lakes Aircraft Corp., Cleveland, Ohio. A complete skeleton of an all-metal 3-purpose Martin type 74 military biplane, which is adapted for commercial service, was shown. This is powered with a Pratt & Whitney engine. The machine was elevated on a stand where all parts of its structure were visible. This was the largest



Typical accessory booths—the Scintilla Magneto Co. and Norma-Hoffmann bearing exhibit.





One of the engines displayed by Pratt & Whitney.



Engine starters exhibited by the Eclipse Company.

and most instructive exhibit in the Armory building. An all-duralumin seaplane float was also shown with its covering removed to show how the structure is built up.

Lockheed Aircraft Corp., Burbank, Calif. The Lockheed company showed the famous Vega monoplane powered with a Whirlwind engine.

E. M. Laird Airplane Co., Chicago, Ill. The newest product of the Laird company, the cabin biplane powered with a Pratt & Whitney engine, the more familiar open cockpit three-place biplane with a Whirlwind engine, and a skeleton fuselage were shown.

Simplex Aircraft Corp., Defiance, Ohio. Two Simplex monoplanes were shown, one with a Warner engine and the other with an inverted Scorpion engine produced by the Aeronautical Products Corporation. This is the first installation of an inverted Scorpion. The fine visibility afforded in the Simplex monoplane by the use of this engine is a valuable feature of the design.

The Aerial Service Corp., Hammondsport, N. Y. The Mercury Kitten cabin monoplane powered with a Warner engine was shown, as well as a new combination landing wheel and ski which makes it possible to land on snow or hard ground with equal facility.

Acme Aircraft Corp., Rockford, Ill. This company showed a Velie engined 2-seater parasol monoplane intended for sport and training purposes.

Mohawk Airplane Corp., Minneapolis, Minn. The low-wing Mohawk Pinto with a 60 h.p. Velie engine was displayed.

A similar model was flown at the airport.

Alliance Aircraft Corp., Alliance, Ohio. The Argo biplane powered with a Hess Warrior engine was shown, as well as a display of parts of the Hess Warrior air-cooled engine.

Heath Airplane Co., Chicago, Ill. The new Super-Parasol monoplane powered with a 4-cylinder Henderson motor was the Heath exhibit. This is the smallest airplane known to be in production. Its small size attracted thousands of young men who wish to build duplicates of this light plane. The Heath company also displayed parts, blueprints and illustrations of the structural strength of wing ribs used.

Wallace Aircraft Co., Chicago, Ill. The OX-5 engined 3-place Wallace Touroplane, a cabin plane designed for pleasure, instruction, taxi service or mail, was on view.

Driggs Aircraft Corp., Lansing, Mich. The Driggs company displayed the 2-seater Skylark biplane powered with an inverted 4-cylinder "Rover" engine of 55 to 60 h.p.

Command-Aire, Inc., Little Rock, Ark. Two Command-Aire biplanes were shown, one with an OX-5 engine and the other with an air-cooled Walter engine. The air-cooled job was well streamlined in the region of the cylinders, and apparently the high speed of the ship has been increased on this account. The company also displayed the Phylax fire-extinguishing system for airplanes.

Around the four sides of the Coliseum, 32 airplane engines were displayed as follows:

Brownback Motor Laboratories, New York City. 6-cylinder Brownback engine type C-400.

American Cirrus Engines, Inc., New York City. 4-cylinder Mark III 95 h.p. at 2100 r.p.m.

Velie Motors Corp., Moline, Ill. 9-cylinder radial and a 5-cylinder engine cut away to show working parts. Velie also had a display of forgings and finished parts, crankshafts, piston rods and assemblies.

Kinner Airplane and Engine Co., Glendale, Cal. The 100 h.p. 5-cylinder K-5 engine, also finished parts, cylinders, parts cut away, etc.

Curtiss Flying Service, Garden City, N. Y. Challenger 6-cylinder 170 h.p. and a display board of Challenger parts. The Chieftain 600 h.p. 12-cylinder air-cooled engine. The motorcycle with an original Curtiss air-cooled engine (8-cylinder 40 h.p.), with which the speed record of 137 m.p.h. was made by Mr. Glenn Curtiss in 1907. The 12-cylinder, water-cooled, 600 h.p. Conqueror engine with gear reduction. A D-12 engine gear train, showing operation.

Michigan Screw Co., Aeronautical Division, Lansing, Mich. The "Rover" inverted 4-cylinder air-cooled engine.

Axelson Machine Co., Los Angeles, Cal. A 7-cylinder air-cooled engine rated at 150 h.p. at 1800 r.p.m.

Aeronautical Products Corp., Naugatuck, Conn. An air-cooled 100 h.p. 4-cylinder-in-line "Scorpion" engine.

(Continued on page 174)



Above—planes in the Armory. Below—the Coliseum.





Orville Wright and delegates to the International Civil Aeronautics Conference at the presentation of the Harmon Trophy to Colonel Charles A. Lindbergh.

## THE AERONAUTIC CONFERENCE

THEY were standing together, huddled in a small group, their backs hunched protectively against the stinging particles of sand blown across the top of this high dune below which, twenty-five years ago, man flew for the first time—a representative of Great Britain, another from Germany and a third from France. Struggling through the shifting sands below them, climbing to the point where they stood were hundreds of persons: mothers with babies in their arms; lean lantern jawed tobacco chewing North Carolinians; curious and laughing darkies, their eyes shining with the excitement of the occasion; little children who some day will be the fliers of a great nation, and bearded ancients, puffing heavily as they made the ascent, old men, some of whom have never yet seen a plane fly.

It was a curious scene for a memorial ceremony—in a desolate and forlorn setting, and the eyes of the visitors from far countries who were ending a most interesting two weeks in America with a part in an international tribute to the first birdmen showed their intense interest in the proceedings and the scene. Eastward they saw more rolling dunes a little lower than the famed Kill Devil Hill upon which they stood, the shores of the Atlantic ocean, unbroken save for the wreck of a tanker, the skeleton spires of the coast-guard wireless station and the little peaked house of the guardsmen. To the north beyond miles of shifting sand, dotted this day with automobiles and trudging pilgrims, lay woods—North Carolina pine, its black green relieved here and there with the brightness of the leaves of the oak and gum not yet blown down by the December

*Delegates Close Historic Meeting  
with Pilgrimage to Kitty Hawk*

By Lauren D. Lyman

winds. Westward lay the waters of the Currituck and Albemarle Sounds, bluer because less ruffled than the ocean itself, and to the south more gum and pine, dogwood and oak.

In the crystal clear air above the picture were birds, squadrons of wild duck flying low and swiftly over the marshes, flanked by the heavier and apparently equally fast geese, holding their formations and speed like pursuit ships, turning with an abruptness that no man designed bird has yet attained. Out over the ocean and higher the gulls dipped and zoomed and above the woods, higher still the buzzards glided, riding the wind currents by taking advantage of them as Wilbur and Orville Wright did twenty-five years ago.

The only flying of the day was by the birds. Sportsmen who visit this hunters' paradise each year wrote letters to Washington asking that planes stay away from Kitty Hawk even on the twenty-fifth anniversary because the noise of the motors and propellers scared the birds!

The little group on the top of Kill Devil Hill soon melted into a larger crowd—Senator Hiram Bingham, president of the National Aeronautical Association; Governor McLean of North Carolina; Josephus Daniels, war Secretary of the Navy; Dwight F. Davis, Secretary of War, and the three under secretaries for Aeronautics of the Departments of Commerce, War and Navy, William P. MacCracken, Jr., F. Trubee Davison and Edward P. Warner. Then there were others, Otto Merkel, head of the great German air system, the Luft Hansa; Captain M. Frank, chief engineer to the Air Ministry in France; Emile Allard, (Continued on page 184)



Wide World Photo

Orville Wright and the Wright Memorial at Kitty Hawk, N. C.



# AIR—HOT AND OTHERWISE

THE Washington Conference was a beautiful gesture and if followed up properly will result in a movement sure to center the world's manufacture of aircraft and general aeronautical advance in the United States. This would enable us to sell advantageously at least in every country of the Western Hemisphere. Let this be possible for one short year, and a generation must elapse before anyone will be able to shake the double-riveted American supremacy which will result.

All the Americas evidenced their vital interest at the Conference. In all, thirty-nine nations were on hand to look, listen and learn.

No difference of opinion existed among those Europeans present as to the fact that our methods will set the pace for the whole world in aircraft as they have in those old-fashioned automotive vehicles designed to travel the earth's surface. They try very hard, in Europe, to dislike Uncle Sam, calling him "Uncle Shylock," and the like, but in their hearts they understand that he's a fine old gentleman—and very wise and skillful. They know, but earnestly deny, as is their European wont, that our methods of manufacture sooner or later will make the propellers of every ship that flies roar with a Yankee twang.

The papers read by learned delegates were in so many languages that we defer our comment on them till the linguistic sharks have kindergartened them for our convenience.

The blind chatter, as it seemed to me, afforded time for thought, and what I worked out was the conviction that another credit must be blackboarded for Secretary "Bill" MacCracken and his gang. His efforts have not been without their significance in the arrival of a situation wherein it is now plain that the aeronautical intelligence of the whole world centers in our Washington. Langley was right (not Wright) about one thing, anyway; the choice of the Potomac as a good thing to fly over and come down on.

The United States Chamber of Commerce Building, where the delegates gathered, faces the White House, and airwaves emanating from it, gathering in the Executive Mansion, should remain strong enough to stimulate with aeronautical enthusiasm the incumbent incoming in March 4. Personally we feel that, without any such incentive, Herbert Hoover, already well acquainted, as he is, with aviation's meaning both in war and in peace, will be the most air-minded chief executive of a great nation in the world, but, be that as it may, that part of Washington during the great meeting was thoroughly impregnated with the right kind of atmosphere for a new president to breathe.

Radio experts say their waves persist. And what is radio to start a wave with more longevity than those originating in a conference of air enthusiasts?

Every now and then I wish that I could write inspiring English. If I could, I should use the full extent of my ability in telling of the thrill which modest Wilbur Wright's personality and presence gave to all of us down there in Washington.

Henry Ford and Lindbergh were there, also, and I insist on saying that no other art and industry, nor any other nation can show a trio half so great as these—Wright, Ford and Lindbergh. Imagine them all living and all present in one room at the same time!

*Washington Conference  
Chicago Show  
Cong. James Returned  
Another Merger*

By Frank A. Tichenor

The father of the art, its rich uncle, king of motorcardom, and its favorite son!

In front of them in the fine auditorium were buzzing human dynamos from thirty-nine great countries—dynamos by which is generated power to fill the air with darting messengers

of civilization, progress and peace.

Wright! Ford! Lindbergh! Try to match 'em!

Wright, a quiet, unassuming man in a gray business suit—of a greater real significance than a hundred Mussolinis.

Ford, who used to run an engine in a water works and is now the greatest manufacturer that this world ever has known.

Lindbergh, "Slim," that quiet kid of a few years ago who unobtrusively stepped into a snug cockpit and sped unflinching into that immortal glow which forever afterward will illumine him as a great historical figure—a model for all youth, a tradition to endure as will that of the giant-killer, David!

American! God bless 'em! Not a medal on the lot. Not a single puff of chestiness. Not an atom of conceit . . . no self consciousness—no damned nonsense. Big.

Most of the time Wright sat modestly among those on the floor, almost hidden by the delegates. Only twice during the whole Conference was it found possible to get him to the platform.

The man who did it all!

Next time you read about such national celebrities as your favorite gunman and the biggest bootlegger, console yourself by thinking about Wright. He's not ancient. Most of the men there in the hall could remember twenty-five years back to that day when startled newspapers told cautiously about that first flight down at Kitty Hawk.

Here is a suggestion for Secretary MacCracken. If these thirty-nine countries would make such a conference an annual matter, if only through the exchange of papers, more would be learned by the aspiring, really earnest workers in the field than through the combined efforts of all the courses in aeronautical instruction operated by the whole world's universities.

Every statement of a theory by such experts as were gathered there in Washington would be backed by aeronautical practice. The pipe-dreamers were not answering to that conference roll call.

NOW climb in for Chicago. It was a great show that we had there by Lake Michigan.

It was a great show, but it would have been a greater one if there had been a rigid house rule against the passing of bushwah, mush, tommyrot, by woefully mistaken press agents who believe that such infernal nonsense pays.

If these shows and conferences keep up, AERO DIGEST soon will have to add a flying editorial room to its equipment. That editorial mind which even tries to be alert enough to keep up with this industry soon will be sure to sprain its ankle.

The Chicago Show was well put on and, if the agents of the various manufacturers are to be believed, more business was done during that one show than elsewhere during the entire year of 1928.

We gathered from the statements of these boomers that anywhere from three to

(Continued on page 182)

# THE BAD BOY OF EUROPE

**A**ND so we come to Italy. The title may be a misnomer but it is taken for the very pertinent reason that Italy under Fascism is rejuvenated to such an extent to-day that she has become a young country—a new country and a country to be conjured with by the Lords of Europe who have held their sway of hundreds of years while the old Italy was crawling out of the chrysalis of the débâcle of the Roman Empire—if you follow me.

And when we come to Italy we come to Signor Mussolini—Il Duce—and rightly so, and as I have said before—may his days be long in the land which the Lord his God giveth him!

This is purely personal. I haven't been invited to luncheon—I've been given nothing without paying for it in Italy—nor have I been fallen upon and subsequently draped with the Order of the Cross of Savoy. Far from it—and far from a lot of other things.

Far, for instance, from democracy as it is preached and practiced in this world to-day, I put my hands up but I won't surrender.

If Cy Caldwell makes his millions before I make mine, headwaiters in New York or anywhere else will treat him better than they treat me—and I can see no real difference between a million dollars and the chain bludgeon in the hands of the robber barons of yore. They are both power—and where power exists the theory of democracy slinks away—just as does communism or any other theory you have to offer. The isms of the world are simply excuses to grab power without working for it. When you speak of Democracy you speak of equality—read Plato—I've no time to argue beyond saying that no man was ever born equal to any other man and never will be and no man ever got along in this world, because

he was helped, *better* than a *better* man got along *because* he *wasn't* helped! Think that over.

Think this over also. The finest government this world has ever known is not the government by a lot of politicians for a lot of politicians, but a government by *one* intelli-

By

James Warner Bellah

Special Foreign Correspondent to  
Aero Digest



The Savoia-Marchetti S-64 with 550 h.p. Fiat engine in which Ferrarin and del Prete established the world's distance records.

gent man for a *lot* of men who haven't the national perspective or the intelligence he has. Perhaps he is conceited and pompous—I don't care about that any more than I care about the clothing he wears. The main thing is the job—and the doing of the job—and he does it.

But let us get into the air. Italy's commercial air service, compared to the commercial air services of Germany, the United States, France or England—in the order of precedence—is efficient, but for miles flown and territory covered is comparatively nil. But Italy's military and naval air services today are decidedly not nil—for there is a man behind them as there is a man behind everything in Italy who will not let anything Italy does, *be* nil.

It is as hard almost to find out anything but results about military (the inclusive term) Italy to-day as it always has been to find out anything about Japan—or as it was twelve to fourteen years ago to find out anything about England—and the reason behind it is what the world calls Franco-phobia—which means that a French waiter (who robs everyone) robs an Italian waiter more than he robs anyone else who sits down at his table. And going to the other side of the sideboard, it means that a Frenchman in Italy is no more welcome to-day than he was when he took the land from



Benito Mussolini—Il Duce

Ventimiglia to Juan les Pins (or was it Antibes?) as security on a war debt (we've had them for years) years ago.

Italy is out for her place in the sun and Mussolini sees that she gets it. Getting it makes a noise but that doesn't matter.

When it comes to his air service, Mussolini, knowing that (Cont. on p. 172)



Major Mario de Bernardi and his Fiat engined Macchi 52 seaplane in which he broke the world's speed record, flying at 318.624 miles an hour.



# AERO DIGEST

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## PAN-AMERICAN AVIATION

PAN-AMERICAN air mail service, as advocated by the president-elect during his South American wanderings, soon will be established. Herbert Hoover, one of the world's greatest citizens, recently elected to the world's greatest post, has had a peculiar opportunity during the war in Europe and, since the war, during the years as chief of the American Department of Commerce, to achieve ability to judge justly the value of commercial aviation in all of its manifestations, among which air mail, so far, has been the most important in America.

The establishment of a well planned and comprehensive air mail service between the United States and the countries south of us will do more than any other one thing possibly could to bind this hemisphere in ties of friendship, in prosperous business relationships and in intimate and satisfactory political associations.

Two routes already have been decided on, one between Miami and Colon, in the Panama Canal Zone, and one hooking us up with Trinidad by air. These are on the verge of operation. A third, extending fast air service from Colon to Santiago, Chile, is soon to be advertised.

Assistant Postmaster General Glover announces that when these routes are fully operative a letter mailed in Montreal on Monday will reach Santiago Saturday. At present, such mail is speedy if it makes the trip in three full weeks. A branch line from Santiago to Buenos Aires will begin a network of air mail lines which eventually will link this country with Eastern South America.

How this news would have delighted Bolivar and all the other splendid statesmen-patriots-economists who have lived and strived among the nations in the southern half of this great hemisphere!

An order sent from South America to the United States by the proposed air mail will reach our manufacturers in time for delivery of the required goods by air to the South American customer before the order could even get to Europe for consideration.

## A GREAT WORKING TEAM

THE United States produces wonderful partnerships. Whether they be in business or the professions, our men work well in teams—more effectively than any others in the world. Now we have an unequal combination in the Army Air Corps.

Generals James A. Fechet and Benjamin Foulois have done literal wonders and will keep on doing them by supreme teamwork.

Various achievements point to the astonishing merit of this splendid official companionship. General Fechet, in his report to the War Department, directs attention to a marked decrease of accidents among Army fliers—a progression as welcome as any possibly could be.

The report covers the first year of the Five-Year Program, and therefore, is of especial interest. The increase

in the sum available for flying pay had immediately good results, as he had predicted that it would have; removal of restrictions on the number of men on flying duty proved to be worth while; the number of enlisted pilots steadily increased; the need for a suitable grade set aside for the exclusive use of men so rated was emphasized; flying cadets must have all encouragement.

A particularly cheerful detail of the paragraph devoted to the subject of air accidents forecasts a rapid decrease for the future.

## MORE NAVY BUNK

PROVIDENCE, in lofty wisdom, postponed action on the so-called Big Navy Bill until after the Christmas recess.

This suggested legislation was from the start recognized by AERO DIGEST as one of the whole world's maddest notions. National Defense we must have, naturally, but why spend staggering millions on defense of Spanish War day design? Senator King, of Utah, was quite right in calling the whole proposition, as it was introduced and stood at the time it was postponed, "stupidly reactionary."

It has not been suggested that motor-transport should be cut out of the Army and millions spent on brand new mules of the well known Noah's Ark, original design. The so-called Big Navy Bill suggests a course for our floating fighting arm which seems about of that intelligence.

AERO DIGEST solemnly believes that to build more cruisers of the old style is to throw money to the octopii, commonly called squids, marine animals from whom the modern Navy borrows the smoke-screen idea and then calls it "new."

The profligate proposition as advanced in Congress dedicates almost countless millions to the building of cruisers and arranges for the construction of one aircraft carrier. The cruisers are a symbol of the days of John Paul Jones. The aircraft carrier is modern.

Just now our fighting fleet needs aircraft carriers—not that pitiful and lonely one which is provided for in the suggestion, but five, at the very least, so that our fleet may be a travelling headquarters for the modern, flying, bombing, winning fighting instrument,—the airplane. America does not mind spending money, but why spend it for gumdrops when dynamite is needed?

## A HOME FOR THE HEROES OF THE AIR

BACK in September the American Legion Aviators' Post Number 743 announced an aircraft exposition to be held in Grand Central Palace, New York, February 6th to 13th. While we believe that, speaking generally, the last few months have held enough of air shows, two big ones, in our opinion, being enough for any one year, we feel that in the case of this American Legion Post, the membership of which is made up of the brave and skillful men who endured peculiar perils for their country during the Great War, everything should be done. These boys have the right to expect the most generous support for anything they care to stage. They have earned every sympathetic coöperation from the industry as from the public.

Sale of space already indicates that the Legion show will be a real success. Its proceeds will start a fund for the construction of a permanent and fitting clubhouse which will be, none of us must forget, also a permanent headquarters for the dissemination of information stimulative in the highest degree to the nation's interest in aeronautics.

# THE BATTLE OF CHICAGO WOOD-ALCOHOL

WELL, folks, just in case this narrative seems a trifle disconnected or distraught, or what-not, here and there, I'd better explain at the start that it is written under difficulties that would make an old war correspondent quail. I'm in a dug-out on the top floor of the Stevens Hotel in Chicago, hiding away with all the other timid old visitors to Chicago who feel nervous as the bullets go whizzing around the lower floors. When I registered here, I said to the clerk, "I want a room that is out of range." He smiled gently at my apparent ignorance of local artillery conditions under the benign reign of his majesty, Big Bill Thompson. "There's no such room in Chicago," replied the clerk, moving his head quickly to let a bullet go by him. "But I can give you a room that is *almost* out of range; and that's the very *best* I can do." He turned to his assistant. "William," he said, "is number 2876 empty yet?" William removed his gas mask and spoke. "They removed the body this morning," he said, and hurriedly adjusted his mask again. "Body?" I queried. "Body," replied the clerk casually. "Man from Peoria—didn't know local conditions—looked out of window—there you are." I must have looked puzzled, for the clerk continued, "Fatal to look out of windows in Chicago. Man looks out—stray bullet looks in—coroner's jury brings in verdict, 'Death due to curiosity.'"

A bell-boy, clad in a suit of chain mail and wearing a tin hat, took my travelling bag and led the way to the elevator. I was surprised to note that there were already two bullet holes through the bag, which explained some of the firing I had heard while I was driving in the taxi. I breathed a silent prayer that they had missed the bottle, and followed the armored boy, who pushed me into a steel elevator and slammed the door just as a fusillade of shots rang out. "Twenty-eight," he said, "and see if you can get up there before the next explosion." "If I really had the hotel's interests at heart, which I haven't," said the elevator man, "I'd wait for that explosion and get blown up—thus saving electricity." "Spare no expense," I entreated. "I'd sooner rise by electricity than by dynamite." The elevator man turned the handle and glanced at me. "A matter of taste," he said as we shot upward. "Some visitors prefer to be blown up. Adds a touch of local color, you know."

So here I am up on the twenty-eighth floor where only the most powerful weapons can carry. I'm at least safe from the little boy bandits with air rifles and the fifteen-year-old underworld queens with pearl-handled 22-caliber pistols. The only bird who can pop me off is, a full-grown gangster equipped with a modern 38-caliber automatic—and in Chicago it's considered quite an honor to get bumped off that way, and a disgrace to be run over by a Ford. So if I get punctured I'll at least have the satisfaction of knowing that it was done with fully modern equipment, able to penetrate the two mattresses that I have leaned up against the window, and the bureau that I have moved over in front of the door.

And that just goes to show the difficulties confronting the literary laborer in Chicago. Before he starts to write he must practically wear himself out building barricades—and then he's tired before he starts. You can always spot a novel written in Chicago; it bears evidence of having

By

*by Caldwell*

been written by a man with a sprained back. And usually there are a flock of words missing, here and there, where bullets have gone through the manuscript while the unfortunate writer was taking it to the post office. However, time, tide, and AERO DIGEST wait for no man, so I'll have to get to work on this article, even in the presence of death and the Chicago

machine-gun battalions. If you can't make any sense out of the thing, blame Mayor Thompson and the ammunition manufacturers. My spirit is willing but my nerves are weak. I don't expect much help from the police department, either. I read in the paper this morning where a man from Oshkosh was held up and robbed on Michigan Boulevard. He rushed to the nearest police station and lodged a complaint against the bandits. And all the good that did him was that the desk sergeant instantly arrested him and charged him with disturbing the police.

I had quite a time finding the Municipal Field here. There must have been a big battle raging between the rival gangsters, with the police taking sides with one or the other, because Chicago was shrouded under a pall of smoke so dense that I couldn't pick out a single speak-easy from the air. And when you can't see a speak-easy in Chicago, it certainly *is* thick. But they tell me it's that way practically all the time; the prohibition boys can't even grope their way into the joints. And the only way the customers ever find the places is by using a compass. They just follow the magnetic needle, and wherever it points, why, there's a speak-easy. It doesn't even matter if the compass hasn't been compensated—it can point any way it wants to and it will always be pointing in a useful direction. Of course, if you lose your compass, you have to ask a policeman—if you can find one outside.

But I must tell you about our arrival at the Municipal Field of Chicago. Or, I should say, our arrival in the air *above* the field. To get to the air immediately above was one thing; to get on the ground was another matter. For Chicago is handicapped by the runway system, which permits only one plane landing at a time. The others must wait in the air, and those on the ground desiring to take off must wait until those in the air have landed. There's no cure for that except finally to make the whole field available for landings—and because of the ground conditions this is almost impossible at Chicago. So we have the spectacle of several fine runways, only one of which may be used at one time. The present situation may be compared to that of a railroad station with only one track—every train must wait until one train has pulled in to the station and then got itself out of the way. In the future, when more money is available, we must get away from these one-track airports. Meanwhile, we sit in the air and go around and around and around—until finally the gentleman with the red flag waves it at us, and we land.

But in Chicago after we had landed our troubles had only begun. We then had to find a hangar where we could park the Fairchild for a few days. Everything was full. This was unavoidable, for the hangar facilities were swamped. But at least someone could have been stationed at the ends of the runways to inform visitors of that fact and to advise them where to stake down their planes. Instead of which we were treated to the peculiar spectacle of airplanes taxiing from the hangar to hangar (*Continued on next page*)



while the passengers or mechanic dashed inside, were told there was no room, and dashed out again—upon which the pilot, with a hearty curse, began his merry chase again. It looked like a Ben-Hur chariot race without the horses.

When I compared this wretched lack of system with the truly wonderful service afforded visitors to the National Air Races at Los Angeles, I am forced to give a large, pathetic groan for Chicago and a rousing cheer for Los Angeles, Cliff Henderson, Dudley Steele, and their efficient corps of experts who made our arrival a thing to remember. However, I finally pulled up in front of the Universal Air Lines hangars, where Shorty Fulton, manager of the new Municipal Field at Akron, greeted me with this: "You'll never get in that place, even with the wings folded. They're full. But in addition to that, there's a great big guy in charge that you better not even go near. He's been bothered so much that his patience is about gone, and he's getting dangerous. And to show you what a hard egg he is, it's away below freezing, and all the rest of us are freezing to death—and this bimbo is walking around in his shirt sleeves." Well, I thought I better take a look at this curio, so I went in, being all ready to go out again in a hurry if I had to—and who should the hard egg turn out to be but my old friend Bill Bliss, who's as pleasant and easy-going as they make them. He just goes around stripped for pugilistic action so everyone won't take advantage of his good nature. Well, I lit right on him and asked him if he didn't have room for one collapsible Fairchild that could be folded up and shoved into a coat closet. Bill just moaned pathetically and said he guessed he'd have to find room some place—so we folded the Fairchild up and tucked it under a Monocoupe, and started off for town. That field, you know, is pretty far out. In fact, that's where people from the Loop district go hunting in the Fall—crap-shooting.

As we drove along in the taxi I noticed that all the flags were at half mast for the 23 Chicago gunmen who had been arrested in the Statler in Cleveland the day before. Those boys should have stayed in Chicago where they were safe and could count on police coöperation. That's a very efficient police force—only a week before there had been a big bank robbery, and already the police had a good description of the bank.

Well, as I said, I got in here and am intrenched for the show. And I intend to see this show, too. Rest assured of that. Never again will I go to an air show and spend all my time in hotel rooms. It's foolish for one thing, and tiring for another. There are a lot of interesting airplanes down at the Coliseum, and I'm going to seeum. And if anyone comes in here and tries to drag me out to one of those room parties, I'm going to throw him right out. At this show I fully and firmly intend to be a man of sterling, or at least nickel-plated, virtue. I'm going to stay in my own room and not go wandering around all over the hotel. And when I'm not doing that, I'm going to be at the show, discussing it gravely with the more serious-minded among us. I'm all off these light-minded pilots who lead pure young men like me astray; I'm going to stick to the solid citizens like Bellanca and Hamilton and Tony Fokker—men who are so busy getting rich that they haven't time to corrupt my drinking morals. And when people say, "Who is that dignified, solemn gentleman over there—the one who adds such a Chesterfieldian grace and social éclat to this gathering?" I want someone else to reply, "That is Cy Caldwell, the reformed racketeer, and a personal friend of Andy Volstead and all the old ladies of both sexes in the Board of Temperance and Public Morals. He's grown so good that if anyone even offers him a drink, he starts crying softly to himself at the wickedness of this awful world."

Oh, my friends, you have no idea how virtuous and uplifted I feel, as I cuddle this high resolve. It would do your hearts good just to look at me. And now I must go out to the show, with the solemn promise to come home early and write all about it.

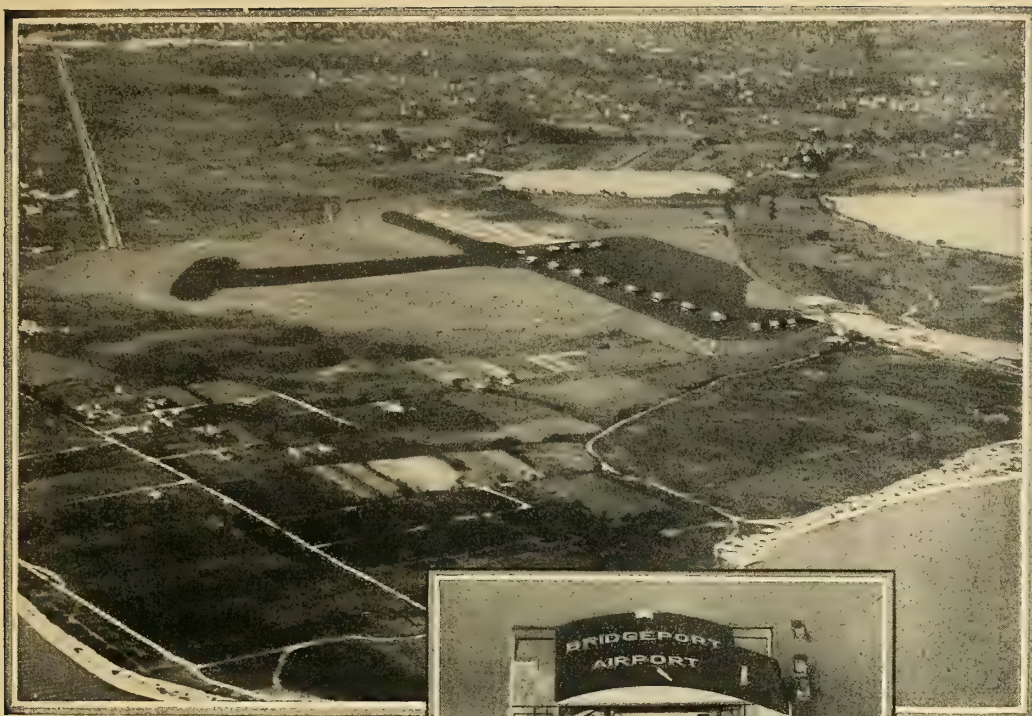
\* \* \* \* \*

That little flock of dots, fellow sufferers, indicates the passage of time—considerable time. In fact, as it says in the theatre programmes, "The curtain will be lowered to denote the passing of a week." I will now raise the thing and let you see what happened to the man of high resolve whom I mentioned in the preceding paragraph, written in Chicago a week ago. This one is being written in St. Louis. And I must confess that the beautiful description I wrote of myself is merely a mirage in the desert of American Volsteadism. No such man exists inside my carcass. The leopard, I regret to confess, not only has been unable to change his spots, but has even added another spot—where he fell and hit his head on the side of the bathtub. But I *did* see the show. I saw it dimly and vaguely, for 35 minutes. Then I got thirsty again and had to stagger back to the Congress Hotel. Yes, the Congress. You recall I started at the Stevens? Well, I not only got mixed up in rooms this time. I even lost my hotel. But let me start off from the beginning as Gibbons did when he wrote "The Decline and Fall of the Roman Empire." I declined and I fell. Yo, ho, ho! And a bottle of rum.

I was just about to start for the show, a week ago, when the phone rang. There's a terrible invention for you—the telephone. More men have been ruined by telephone numbers than by any other cause, not excluding Ford coops. In this case George Haldeman got wise to the fact that I was staying at the Stevens, and called me. That was the beginning of the end for me. "Listen," he said—and how pathetic and weak he sounded—"I'm marooned over here at the Congress with a touch of flu, grippe, bronchitis, and croup. For the love of Mike come over and cheer me up. I'm so low, I'd have to look up to see an earthworm." My heart was touched. "George," I said, "I shall delay my departure for the show an hour, and come right over. But remember! I can't stay more than an hour. Even if you are dying, my dear friend, and want me with you, you've got to die within the next hour, or die alone so far as I'm concerned. For I AM GOING TO SEE THAT SHOW."

Well, folks, you'd have burst out crying if you could have seen how my dear old friend looked. I only recognized him by his tortoise-shell glasses. They were the only things that hadn't wasted away during his illness. "George," I said, "You're looking fine—I'll have you out of that bed in a day. I don't know what a big husky fellow like you is thinking of to be in bed. Lack of moral force, that's all." You know—the usual line of hooey you hand to a sick man. He merely looked at me in disgust. "I'm sick," he said. "Can you do anything for me?" "George," I said, "I can." And I took out my flask. Instantly he looked greatly improved. Now you're talking!" he exclaimed, and started to get out of bed. "Wait!" I said. "Let this work on you first. And I'll have one with you—just one, because I must go to the show—but I'm not feeling any too good either. I have a little cough." And I gave a hollow cough just to prove it.

Well, you know how it is. A bird can't fly with only one wing; and a pilot is all lopsided with just one drink. So we had to even up by taking another. And that one tilted us slightly to the left, which necessitated another small one on the right—which made us a little bit one-wing low on *that* side. Well, I did my best to, line us up in correct flying trim—first a little wash-in on this side, then a bit of a wash-out on that side, until I (Continued on page 179)



Above: The Bridgeport, Conn., Airport (built by the Kenegan Corporation, New York City), will rank as one of the finest in the world. Aviators who have used the two Tarvia runways, each 4000 feet long by 500 wide, are enthusiastic about the ideal landing and take-off surface.

At left: A hangar of the Bridgeport, Conn., Airport, facing on Tarvia runway

# Tarvia

## PATHWAYS *into the* SKY

SINCE 1903, Barrett Company engineers have specialized in road construction and maintenance in every section of the country. These men know how to utilize local materials—how to cope with local difficulties. They have made possible the tremendous mileage of Tarvia roads.

Now—a new field. Take advantage of the Tarvia man's vast fund of accumulated knowledge. Let him help you with this new problem.

Tarvia runways are resilient. They are economical—may be constructed largely of local materials. They are mudless, dustless and skid-safe.

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# RESEARCH AND THE AIRPLANE

By William H. Miller  
(Part II)

THE comparatively high efficiency of the air propellers designed by the Wright brothers for their first machine caused early recognition of the importance of developing this vital part of the airplane. In 1908-09 the theory of the air screw was approached from two somewhat different physical viewpoints by Lanchester (in his "Aerodynamics") and M. Stephane Drzewiecki, a distinguished Polish engineer, who in his "Des Helices Aeriennes" simply extended his methods of designing marine propellers which had been communicated in 1892 to the Association Technique Maritime. Today, the modern theory of the air propeller is based largely on the physical reasoning first promulgated by Lanchester and Drzewiecki. In more recent years original contributions to propeller theory have been made by Joukowski, Betz, Bothezat, and Glauert.

In 1910 Professor N. Joukowski of the University of Moscow enunciated certain fundamental principles concerning the behavior of plane and arched surfaces in a non-viscous, incompressible fluid. His studies were confined to the flow about the section of a wing of infinitely great span; but they constituted the first *quantitative* theory of the generation of lift. Later—about the time that Joukowski published his memorable work on aerodynamics—Dr. Prandtl and his assistants at Göttingen undertook and succeeded in solving important problems dealing with actual wings of limited span, the theory of the air propeller, and distribution of pressure over airships. Wind tunnel experiments conducted with models of wings and streamline bodies gave quite satisfactory confirmation of their theoretical deductions; and a number of other scientists immediately began the extension of this important work. Simultaneously, the British, French, and Italians were making substantial contributions to the dynamics of mechanical flight. Professor Bryan in England, and Colonel Crocco, in Italy, developed the basic methods of dealing with problems concerning the disturbed motion of airplanes and lighter-than-air craft, and derived mathematical formulas for calculating stability and controllability.

The wind tunnel was employed in this country in 1904 by Dr. A. F. Zahm of Washington, D. C., in his noted researches on the frictional resistance of plane surfaces. Dr. Zahm's subsequent contributions to aeronautical science have been of a varied and important character. He has devised and improved laboratory apparatus, airplane instruments, and aerodynamic and structural design methods. He enjoys the unique distinction of having been the first director of research for a commercial airplane concern in this country, having occupied that position with the Cur-

tiss Aeroplane and Motor Company in 1915.

The first complete aerodynamical laboratory in the United States was erected at the Massachusetts Institute of Technology in 1915, by Prof. Edwin B. Wilson and Commander (then Lieutenant) Jerome C. Hunsaker, a graduate student from the Naval Academy. Basic design data for many of the early airplanes of the Army and Navy were obtained in the historic old M.I.T. wind tunnel. Commander Hunsaker and Col. V. E. Clark conducted notable research tests on the stability of airplanes, and their work on the subject was the first of that kind undertaken in this country. (In 1922-23 the old M.I.T. laboratory was dismantled and replaced by new equipment, including two modern wind tunnels.)

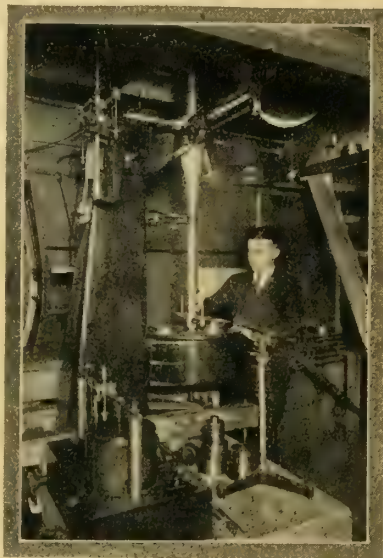
In 1913, Eiffel's monumental work, "Le Resistance de l'Air et Aviation," was translated into English by Hunsaker. This important volume was a compendium of Eiffel's researches conducted in his modern aerodynamical

laboratory at Auteuil near Paris. Its publication marked the beginning of real aeronautical engineering in this country; for it contained precisely the information needed by airplane designers who wished to employ sound engineering methods.

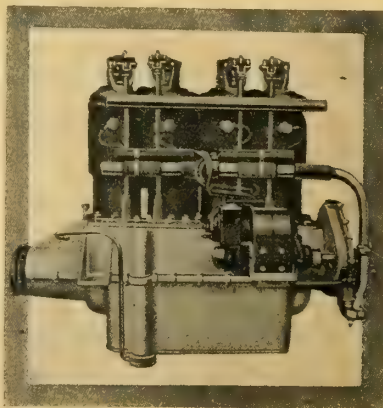
The development of the airplane was, of course, vitally dependent upon the improvement of its power plant. We have already mentioned that the first successful gasoline engine designed primarily for an aircraft was that of the late Chas. M. Manly, and that the motor was installed in Langley's aerodrome in 1901. With the possible exception of the Forest engine in 1888, it was the first successful radial type. The Manly engine had five water-cooled cylinders disposed radially about its crankshaft, and developed 52 horsepower at 950 revolutions per minute with 540 cubic inches total piston displacement. The complete power plant—including radiator, fuel tanks, and water—weighed only 3.66 pounds per brake horsepower, which figure is lower than that of some of the more modern installations.

During the period 1904 to 1914, Glenn H. Curtiss designed and built a series of air and water-cooled motors that were destined to have a marked effect upon the aircraft industry in this country. Very successful water-cooled motors were also designed and built by Charles B. Kirkham, one of the early aircraft constructors, and by the Benz Company in Germany, the Clement-Bayard Company in France, the Fiat Company in Italy, and many others, among which were a number of the pioneer European concerns which built modifications of the early Wright motor under license.

The first air-cooled radial type



William Miller at the Curtiss wind tunnel balance.



The Kirkham water-cooled engine

# When the World's Crack Trains are too Slow!



Northwest Airways, Incorporated, in connection with three of the great western railroads, have selected Pratt & Whitney powered equipment to carry on the first air-rail route.

By the use of Ford tri-motor and Hamilton single-engine planes, now in daily operation between Chicago and St. Paul and Minneapolis, a full business day is saved the traveller on his trip to the East or West Coast.

Passengers have the assurance on this line that the Pratt & Whitney engines behind which they ride embody the finest in modern design and workmanship — engines with an international reputation for dependability.



THE  
**PRATT & WHITNEY AIRCRAFT CO.**  
HARTFORD CONNECTICUT



motor was designed by A. Anzani in France in 1908. It is interesting to note that both Anzani and Curtiss had engaged in the manufacture of motorcycles prior to specializing in aircraft motors. Charles W. Lawrance, was one of the earliest designers of radial motors in America. And today, like M. Anzani, he is at the head of one of the largest companies in the world engaged exclusively in the production of aircraft engines. The work of Mr. Curtiss in this field has been carried on lately by Arthur Nutt of the Curtiss company in Buffalo, N. Y., who has designed an original series of engines—both air and water-cooled—for use in high speed fighting and racing airplanes.

The so-called "rotary engine," that is, one in which the crankshaft is fixed and the radially placed cylinders revolve about it, was used extensively during the war, especially in small single-seat fighting planes. This type, the first of which was built and tested in 1897 by F. O. Farwell of Dubuque, Iowa, was brought to a high degree of perfection before and during the war by Laurent Seguin of France.

While the pioneer development of aircraft engines was formerly more inventive than scientific, technicians now coöperate in its design and production in the same manner as with any other modern engineering product. Science played a conspicuous part in engine development in connection with the materials and processes of fabrication, improvements in design theory, methods of testing, etc. The necessity of maintaining power at high altitudes with certain types of fighting craft has caused intensive development of the supercharger, an auxiliary device driven by the engine itself, for the purpose of supplying the carburetor with air of normal (or abnormal) density. Dr. Sanford A. Moss, of the General Electric Company, has been most prominently identified with American supercharger development. The theory of superchargers from airplane motors was highly developed by M. Rateau, in France before the War. His early designs served as a basis for future improvements.

Although changes in aeronautical science and consequent improvements in the airplane were most prominent during the great World War, our space does not permit of their chronology. Let it suffice to state that while the airplane itself was refined somewhat in detail the intensive war-time production necessitated a minimum of changes in general design. By the time the war had ended, however, the science

of aeronautics had received contributions from scores of mathematicians, physicists, metallurgists, chemists, naval architects, mechanical, civil, and electrical engineers, etc. The information had been held confidential during the war; and because of the vast amount derived from research, real "airplane engineering", a short time after, began to embrace most of the other more specialized branches of engineering. The airplane, instead of remaining the product of an individual designer and builder became the result of the work of a group of specialists coöperating in the various phases of its design and production.



Courtesy of General Electric

Diagram of the Moss supercharger

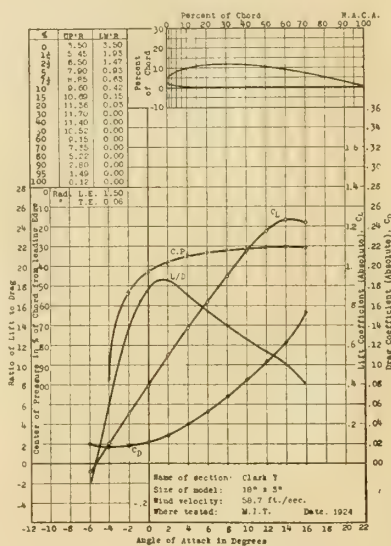
During the war, it was found that the usual methods employed in ordinary structural design had to be refined enormously in the case of the airplane, which must obviously be a structure of great strength to weight ratio. Extensions of the theory of structures as well as the low weight requirements of design immediately necessitated the development of reliable materials of various kinds whose chemical and physical properties were accurately known. A vast amount of information on wood materials, glues, etc. has been furnished by the United States Forest Products Laboratory, at Madison, Wisconsin. Here we find

the foremost specialists in wood technology creating new types of materials and types of construction, formulating process specifications, dividing methods of fabrication, and advancing the science of wood technology. In the metallurgical field, new alloy steels of great tensile strength and non-ferrous metals of low weight have been produced. The structural engineer has constantly improved types of construction until now it is not uncommon for the useful load of the large airplane to be fifty per cent of the gross weight.

Notable contributions to the theory of structures, with special reference to the airplane, have been made by Arthur Berry, A. J. Sutton Pippard, and Captain J. Laurence Pritchard, in England.

We are now entering the era in which aeronautical research must be divided into two parts, namely, "pure," and "industrial." In this country there are ample facilities for conducting pure research—that is, for solving problems of a general and fundamental nature which are of importance to the industry and to the advancement of science. The Langley Memorial Aeronautical Laboratory maintained by our National Advisory Committee for Aeronautics at Langley Field, Hampton, Virginia, has a vast staff of physicists, chemists, engineers, draftsmen, instrument makers, etc. who are turning out valuable reports on experimental and theoretical projects suggested.

(Continued on page 174)



Characteristics of the Clark Y wing curve developed by Colonel V. E. Clark



Exterior of the Curtiss wind tunnel

# *A new* organization

The formation of the Knoll Aircraft Corporation has been effected in order to bring together a combination of three vitally important factors—an experienced engineering staff of highest calibre—a manufacturing plant with every possible facility for high quality and quantity production—and ample capital for research as well as for operation.

The engineering staff will be headed by Mr. Felix W. A. Knoll, an aeronautical engineer of international reputation. Mr. Knoll, as consulting engineer and as engineer for the Rohrbach All-Metal Airplane Company and for the Heinkle Aircraft Company, has been responsible for the design of a large number of highly successful aircraft of many types. His experience ranges from single place sport planes and military aircraft to transport planes of every capacity, including the famous "Bero", the largest airplane ever constructed, built for the Imperial Airways by Rohrbach.

Mr. Knoll will be assisted by a complete staff of engineers of his own choice.

## THE KNOLL AIRCRAFT CORPORATION

Wichita, Kansas



# PERSONALITIES

IF you saw Senior Lieutenant D. W. Tomlinson, U. S. N., leading the famous Three Sea Hawks through their amazing evolutions at the National Air Races at Los Angeles, the best stunt flying that ever has been performed by any three pilots anywhere, you may have wondered where Tomlinson acquired the skill needed to fly within a few feet—and it looked like inches—of another plane. I'll tell you. He had so much experience looping and rolling through the legal technicalities of the great United States Navy that merely to go up and perform the same evolutions in an airplane was child's play to him.

Lieut. Tomlinson started flying H boats at Hampton Roads in 1918, survived that, and was sent to Pensacola in 1920. He is one of the few Navy pilots who got through Pensacola without an accident—he didn't get married there. The Navy, amazed at his escape, sent him to North Island, San Diego, where he could learn to fly landplanes and wallow in the luxury of the Spanish Mission style buildings. That was in 1921, an unlucky year for Tomlinson, because his motor failed when he was flying over Coronado, which forced him to land in that interesting town. The Navy instantly gave him a general court-martial, charging him with "failing to maintain altitude." They should have court-martialed the engine as well, but somehow they let it off.

Tomlinson did a spin out of this court-martial and landed in a single seat Vought, in which he approached a formation of four Voughts just as they changed formation from line to V. Tomlinson pulled out to the right as Lieut. Blackwell flew in from the port side. Blackwell's right lower wing took off Tomlinson's fuselage right back of the cockpit, while his propeller chewed the entire left wing from Tomlinson's plane, which came down in a flat spin and landed in the mud of the bay. Tomlinson himself suffered from concussion and a broken left arm, and landed right in the middle of another court-martial, charged with manslaughter—for Lieut. Blackwell unfortunately had died in the crash of his plane. Six months later Lieut. Tomlinson was acquitted and kicked out of aviation. This ought to have finished his aerial activities. But it didn't.

In November, 1922, he bought a Jennie for \$250, flew from the Atlantic Coast to Seattle, to Canada, and to Mexico, from which he returned in 1923. After wearing the Jennie completely out, he sold it for \$500—just twice what he had paid for it. (He and Charlie Levine should hit it off well, eh?) Then he barnstormed in a Seagull, à la Bob Moore, which wore him down to a point where he was willing to report to Annapolis and instruct on gas engines. While there, in 1924 and 1925, he rebuilt his own Jennie in the Naval Academy, and in 1925 flew that Jennie from Annapolis to San Diego—no mean feat. In fact, I'd about as



by Caldwell



The Three Sea Hawks

soon try getting a canal boat over the Rockies as I would an OX-5 Jennie. He reported to Squadron 2 as Executive Officer in that year and stuck with it to the date of the races, by which time it had changed its name to VB2 and had become the premier stunt squadron of the Navy.

Credit for this work is largely due to Lieut. Tomlinson, who had command of the squadron during April, May, and June, 1928. In January, 1928, he started practising tight formations with Lieutenants W. V. Davis and A. P. Storrs, and evolved the famous combination that is known as the Three Sea Hawks. Davis, by the way, was navigator for Art Goebel in the Dole Disaster, so this stunting about with the Hawks is merely a vacation from long-distance suicide.

Tomlinson has had several narrow escapes, but from the determined way in which he was constantly following a charming young

lady at the air races, I fear that he is about to meet up with one of those permanent accidents that seem to overtake all of us, sooner or later. And if he does, I hazard the guess that the Three Sea Hawks will be forced to fly considerably farther apart in the future than they have flown in the past.

IN El Paso, Texas, while on my way back from the air races at Los Angeles, I met H. W. "Dusty" Waller, manager of the Hussmann Hotel. And the only reason I haven't mentioned him before is because I was waiting for him to send me a picture of himself for this department. At last the picture arrived—the picture of this flock of Mexican Indians. On the back of it Dusty wrote: "Enjoying myself in Chihuahua, Mexico. Wish you were with me." So I presume that Dusty is one of this crew. I think he's the third one from the left. Or he may be the end one. Dusty, if you preferred to pose along with your friends, you mustn't blame me if I can't pick you out.

Dusty is known along the Rio Grande as the flying hotel manager. He's had about 14 hours' dual and is ready for solo—has been ready for some time. The only thing that holds him back is that he can't find a free ship to solo in. Because he's a born Godunk—he won't pay for a flight because everybody spoils him. He's such good company, especially with a glass in his hand, that everyone rides him around gratis. He's made three return flights to Los Angeles, several to San Antonio, Laredo, Tucson, Phoenix, Marfa, and other places. And the only expense he has been put to is for drinks.

Dusty was born on the old Turkey Trot ranch, near Carlsbad, New Mexico, and wore high-heeled boots and spurs until he was 15 years old. He still feels a bit queer in a Tuxedo. Under his management the Hussmann has become the pilots' headquarters for El Paso. If you're down that way drop in and see him. He'll make you feel more at home than you ever felt in a hotel. And if any of you pilots are flying from Los Angeles to the air races at Cleveland next year, don't forget that Dusty is looking around for a free ride to Cleveland. Believe me, he's worth taking along. Tote him—and make room for a large cargo of Mexican laughing water in pint bottles.



Pick out Dusty Waller

L. T. O. P. HARRAH, of Wichita, was barnstorming at a rodeo on a ranch near Protection, Kansas, when three buffaloes used in the rodeo escaped and went galloping over the plains. Harrah took off in a Travel Air, and soon located the three buffaloes, after which he circled around, directing mounted men to the spot. I'm sorry I haven't a picture of Harrah, or the buffaloes, or even of the spot they were standing on, to prove the truth of all this. It sounds like a lot of bull to me.

(Continued on next page)

# Not only BEAUTY but lasting beauty

**A**N airplane may be very beautiful indeed in its sparkling finish—brand new from the maker's hands. But all too soon, exposure to rain and sun and the constant strain of vibration and flexing destroy the original lustre and dim the beauty of the finish.

The reason is very simple. Ordinary aircraft lacquers are inadequate to meet the demands made upon them by actual flying conditions. A very special lacquer is needed.

The Murphy Varnish Company is proud to state that it has perfected a finishing material that is truly revolutionary in its superiority for aircraft surfaces. Its name—a long one—is Murphy Aircraft Clear Flexible Finishing Lacquer.

Applied as a finishing coat over colored spray lacquer, it dries to a very high gloss which it maintains even under extreme conditions. It not only definitely resists the destructive bleaching



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*Aircraft Colored Flexible Finishing Lacquer*

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### MURPHY FINE FINISHES

*Famous for 64 years among architects, master painters and makers of products requiring a fine finish*

effect of the sun's ultra violet rays, but it also has sufficient "give" to stand up under the stress and strain to which aircraft surfaces are necessarily subjected. Mixed with aluminum powder, it forms a lasting, durable finish. Metallic powders actually "leaf" in this lacquer.

Because Murphy Aircraft Clear Flexible Finishing Lacquer develops a surface that is so glossy smooth, it is extremely easy to keep clean—an important consideration. It enables the owner to keep his ship in fine appearance with a minimum of effort. A source of pride to the owner, and good advertising for the maker.

You owe it to yourself and your business to learn all the facts about this remarkable material. Try out a sample of it or write for further information.

### MURPHY VARNISH COMPANY

NEWARK CHICAGO SAN FRANCISCO MONTREAL

# Murphy Aircraft Clear Flexible Finishing Lacquer





(Person-Alltimes continued)

HERE is Pilot Waldo D. Waterman, who tells me himself that he claims the international air record for having the largest feet of any pilot in the world. On this picture, which he sent me, he said there wasn't room to get the feet in—and you can see for yourself that there isn't.



W. D. Waterman

He also claims a record for his pipe, which he states has had more hours in the air than any other incinerator in this country. It has a fuel capacity of one-fourth tin of Edgeworth and has a range of 250 miles without refueling.

Waterman has been identified with aviation since 1909, when he built and flew a glider at San Diego. Probably crashed it. In 1910 he built his own airplane, made a series of flights, and ended with a crash, after which he joined the Curtiss Co., then at San Diego, where he flew again. From 1912 to 1916 he attended the University of California, studying Mechanical Engineering, and in 1917 instructed in Airplane Department, Western Division Ground School of U. S. Army. In 1918 he was Chief Engineer of the U. S. Aircraft Corp., building planes for U. S. Army. During the next two years he was head of Waterman Aircraft Motor Mfg. Co. His activities since then include a tour of the American aircraft industry, during which he rode on practically every contract air mail line in the country in 1926. In 1927 he was experimental engineer and test pilot for Bach Aircraft Co., and developed a radial air-cooled engine from the old water-cooled Salmson. He is now General Manager L. A. Metropolitan Airport and is retained in a consultant capacity by Bach Aircraft Co. and others. He is a member of the Professional Pilots' Association, and was president in 1925 and 1926.

WHEN citizens of Milwaukee watched those two Fairchild's taxiing down the main street of the city, there was almost as much excitement as there was the day Schlitz closed his brewery, and everyone in Milwaukee thought they were going to die of thirst. Captain Leslie Mulzer piloted one taxi and Edgar La Parle the other. You can't see these two boys in the picture, nor can you see the metal that the stone and concrete-paved streets of Milwaukee scraped off the tail-skid shoes. But it's there, somewhere along the line of march, because you can't drag a metal skid all over the streets of a city and have it still with you.

I made a few experiments along those lines while flying off Mr. Ford's concrete runway at Dearborn recently—six landings and six take-offs, and I had a hole right through the shoe. It was one of the small shoes, and Dick Depew was presenting us with the large size, so I thought I might as well wear the little one out and get rid of it as soon as possible. That concrete runway was the right place to bring a shoe that wanted wearing out—six applications and the patient was cured. Which brings us right down to the thing that should be hung on the hind end of an airplane—a rubber-tired wheel. Now that we have brakes, good, bad, and indifferent, why cling to the old-fashioned tail skid, that bumps and drags along and wears out the grass of the fields? Why not the little wheel, easy on the field, easy on the plane, and easy to push around without breaking your back lifting a whole fuselage onto a dolly? Some planes already use this feature, and the others soon must fall in line. That concrete runway is the finest thing I have yet taken off of or landed on—but you can't use it with a tail-skid, and still retain the shoe. To-day a tail-skid is as obsolete as the hand brake on a street car.

ESTHETIC and musical diversions of the sea-pigs, as reported by Robert W. Gamble and Ronald Johnstone of Seattle:

"We feel in duty bound to report a little incident that occurred here during the recent 'Fleet Week.' It was the night of the Naval Ball; gold braid was glittering and women were tittering. During the intermission there was a soulful rendering of a hymn to the Duke of Potomac. It happened to be sung by an ADMIRAL'S NIECE. The Duke, by some strange whim of fate, knew whose niece it was, too. This little ballad had to do with the personal qualities of the Duke. Each letter of his name stood for some admirable quality rarely found in men of this world. W stood for wonderful, I for intelligence, L for love of the Navy, U stands for understanding of the Navy and its needs, and so on. All this took place as the Duke stood in the midst of the admiring throng. Needless to say, the proud uncle, THE ADMIRAL, was nearby. This little display was such an obvious piece of political buncombe that we thought you would like to hear about it." I'm delighted with it—I'm passing it right along to the six faithful adherents, who have stood by me through thick and thin. But this is a bit too thick.

JOHNSON WRIGHT of Miami tells me of an Atlantic flight that escaped my notice. A gent in a landplane flew 20 miles out over the Atlantic, and then made a



Cal Latham

perfect three-point landing when the motor cut out. He had miscalculated his gliding distance to shore, I suppose. I think some of these babies believe that they can fly out of sight of land and, when the engine fails, glide either to America or Europe, and step out with a pleased expression on their faces. This particular bimbo found himself in the water, staring straight into the face of an intensely interested shark. An embarrassing moment, what?

However, the special Providence that looks after fools and drunken men arrived in the person of Pilot Cal Latham, of Rogers Air Lines, Inc., who was returning from the islands in his trusty Seagull—new glands by Dr. Harry Rogers, himself. Cal looked down just as the landplane slid into Davy Jones' locker, and promptly landed beside the deep-sea bather and his attendant shark. He rescued the bather and disappointed the shark. Personally, I think Cal played a low-down trick on a deserving shark.

A MILWAUKEE student of a correspondence school wrote the replies to his examination papers while flying as a passenger from New York to Milwaukee—some 900 miles at an average speed of 90 miles an hour and an average height of 3,000 feet. Naturally he passed high.



Two Fairchild's taxiing along the streets of Milwaukee, from the Post Office to the Airport.



# YOUTH

## demands the best

### DISTRIBUTORS

There are reasons why EAGLEROCK has become the most popular training plane. In its design the student or young flyer has been prominent in the minds of the manufacturers. Its operation is simplicity itself. Its performance is nationally known. Its ruggedness is an acknowledged feature. And the price—\$2250 at factory, less propeller and power plant of 90 to 270 h.p.

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 Alaska.—Meals Eaglerock Sales Co., Valdez  
 Minn.—Minnesota Aircraft Co., 406 6th Ave., Minneapolis  
 W. Penn. & N. Ohio.—Morris Flying Service, Rodgers Field, R. D. No. 2, Sharpsburg, Pa.  
 N. Ill.—Jack Oates, Inc., 5101 W. Madison, Chicago  
 Ore.—Oregon Eaglerock Sales Co., 439 E. 46th St. N., Portland  
 N. Iowa.—Pioneer Flyers, Inc., 24 Second St., N. E. Mason City  
 N. & S. Dak.—Rapid Air Lines, Inc., 1st Natl. Bank Bldg., Rapid City  
 Fla.—Raymond Aircraft Co., Haldeman-Elder Airport, Lakeland  
 Nev.—Francis A. Riordon Flying School, Ely  
 Utah.—Rocky Mountain Flying Service, 125 E. 1st So. St., Salt Lake City  
 Md. & E. Penn.—Mt. Vernon Airways, Rt. 5, Alexandria, Va.  
 W. Va. & E. Ohio.—Lyle H. Scott, 328 2nd St., Marietta, Ohio  
 Miss.—Sellers Motor Co., Box 622, Jackson  
 Okla. & Tex.—Panhandle—Southwest Airways Corp., Rt. 5, Oklahoma City  
 N. J. & Del.—Sulberger Aircraft Sales Corp., c/o Kreuze Dept. Store, Newark  
 Tenn.—Tri-States Airways, c/o Bry Block Merc. Co., Memphis, Tenn.  
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DEPT. 403, ALEXANDER AIRCRAFT CO., COLORADO SPRINGS, COLO.

# The New EAGLEROCK



# AIRPORT AND AIRWAY

*News of airlines, airports, and airways; radio, lighting and other auxiliary services*

By  
Edgar H. Felix

**S**PEAKING at the autumn meeting of the National Academy of Sciences, Dr. E. F. W. Alexanderson, consulting engineer of the General Electric Company, described the basic principle of a new method of measuring the height above ground of a plane in flight, using high frequency radio transmission and reception. The method consists briefly of observing the effect of the reflected ground wave, radiated from an airplane transmitter. The well known principle of heterodyning is employed. A continuous wave of a known frequency is radiated from a transmitter aboard the plane. This frequency is heterodyned in the radio receiver by the reflected ground frequency. When the plane is at a height which is an exact multiple of the wavelength, the two waves affecting the receiving system are in synchrony and no beat note is heard. As the airplane changes its altitude by half a wavelength, the whistling note resulting goes through a complete tone cycle from low pitch to high pitch and back again. By counting the cycles of the tone, it is possible to measure altitude, the measuring stick being one-half the wave length of the antenna oscillator. In the first tests, Dr. Alexanderson, blindfolded and using headphones, determined accurately the altitude up to 1,600 feet. Graphic altitude logs, developed later, have been used to make measurements up to 4,000 feet.

The experimental model, shown in the illustration, consists of a short-wave radio receiver which is tuned to the transmitted signal and its reflection from the ground. Vacuum tube amplification brings up the combined signals to a level sufficient so that the resulting heterodyne note frequency can be accurately determined and recorded in graph form on the basis of frequency against time. These readings may be checked against those of a recording barograph. By this double check, accurate determinations have been made experimentally.

The device is far from the commercial stage and considerable observation must be made before its practical usefulness is definitely determined. The influence of ground conditions and their varying reflecting power may be greater than is at present realized, while the vagaries of short waves may introduce an element of inaccuracy which may militate against the widespread practical em-

ployment of the method. Accuracy, fortunately, increases as the plane nears the ground. However, it is the first radical departure from optical methods of determining



A Westinghouse floodlight projector

height above ground with all their defects and, in the hands of such competent research forces as those of the General Electric Company, undoubtedly its possibilities will be fully explored.

**A**T the same meeting, Dr. J. D. Tear of the Research Laboratories of the General Electric Company described a magneto compass which is said to have distinct advantages over types now used, such as the earth inductor compass. It weighs but one-fifth or one-sixth as much as the present type of earth inductor compass.

The lines of force of the earth's magnetic field are not horizontal—in the State of New

York they dip so that a freely suspended magnetic needle points to the magnetic north at an angle of about 70 degrees with the horizontal. In the making of magnetic and induction compasses, it is necessary to take into account this angular direction of the magnetic lines of force, and the instruments are so designed that only the horizontal part of the magnetic force is used.

When a bar of iron is held in a horizontal position, the number of magnetic lines of force induced in the bar, and therefore the intensity of magnetization in the bar, depends only on the direction in the horizontal in which the bar is facing.

In the magneto compass, a bar of permalloy, a nickel-iron alloy that has the unusual ability of quickly changing its magnetic qualities according to the magnetic field in which it may be placed, is held constantly in a horizontal position by means of a pendulum which hangs vertically, irrespective of the angle at which the airplane may be flying. In a cavity within the bar of permalloy is placed an armature that is rotated at approximately 1,200 revolutions per minute. Depending on the amount of magnetism in the bar of permalloy, the electricity produced in the armature varies. This varying current is indicated on a meter or other device in front of the pilot so that any deviation from a predetermined course is at once apparent to the pilot.

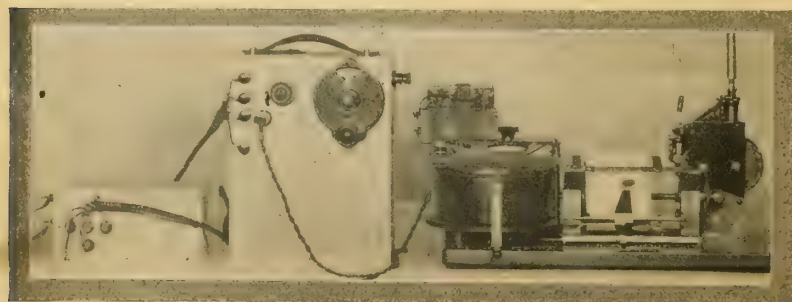
The laboratory model, which has been used in the experiments at the Schenectady airport, weighs only two pounds and is mounted in the tail of the plane so as to be away from the magnetic influence of the engine and other steel and iron parts in the plane. The rotating armature is driven by a small propeller.

When the pilot wishes to set his course in a definite direction, he sets the indicator to the desired position. Any deviation of the ship from the chosen course then results in the changed magnetic field causing a difference in the electric current and therefore in the reading of the indicator.

The magneto compass is adjusted so that the readings of the instrument are governed by the maximum voltages generated by the rotating coil or armature. The zero voltage adjustment, used in some types of instruments, has a disadvantage of being affected materially by any variations resulting from armature brushes being out of adjustment; in the case of the magneto compass, such a variation results only in less sensitivity of the instrument and not in an error of indicated direction of flight.

In the experiments with the new direction indicator, Dr. Tear has also used permivar, a cobalt-nickel-iron alloy, and other ferromagnetic substances possessing low coercive force, as the material for the bar; and in place of the rotating coil, he has also employed a magnetron tube, the current passing through which is similarly affected by surrounding magnetic fields.

(Continued on next page)



The Alexanderson radio-altitude indicator.



Mines Field, Los Angeles, as illuminated for the National Air Races by Westinghouse. (Note the evenly diffused light and the sharp cut-off of the glaring upward rays)

## The Utmost in Airport Illumination

THE entire field lighted as brilliantly as day.

No glaring upward rays to blind the pilot as he levels off for a landing.

Multiple lighting units to eliminate the danger of lighting failure at a critical moment.

Flexibility of installation to economically take care of increased night traffic, or to properly illuminate uneven terrain.

These essential qualifications of airport illumination are fully provided by an installation of Westinghouse Chromilite landing field floodlights.



Westinghouse Electric & Manufacturing Company  
South Bend Works      South Bend, Indiana

Sales Offices in All Principal Cities of  
the United States and Foreign Countries

# Westinghouse

T 30163



(Continued from preceding page)

### Lighting the Airport and the Airway

THE science of electrical illumination has been so advanced by its manifold specialized applications in industry that it has lost no time in adapting itself to the new requirements of aviation. It was only necessary to determine what the new means of travel needed and the leaders in the electrical field promptly provided satisfactory equipment as an immediate answer to its needs.

Aeronautic illuminating equipment falls naturally into three classes: (1) airplane headlighting; (2) airway lighting; and (3) airport floodlighting.

With the vast experience in the design and manufacture of automobile headlights, it was not difficult to adapt existing equipment to this new use. The principal distinction between the automobile and the airplane headlight is the greater illumination required, the importance of light weight and good streamlining for aircraft use. Compensating for the considerably increased current drain of the powerful airplane headlight is the fact that it is used only periodically and at widely separated intervals.

Mr. A. Paulus of the Westinghouse Lamp Company has submitted data on various types of Mazda lamps especially adapted to the various aeronautic uses, manufactured by his company. The G-25 bulb has been especially designed for airplane headlighting. It draws 35 amperes at 12 volts, making its total power 420 watts.

We have also seen reports of a new lamp for night flying planes, being perfected in England. It is known as the Phillips aviation lamp. It has a spherical base and a long, small diameter neck. To prevent blackening, the Phillips lamp is mounted in an almost vertical position. Used with a parabolical mirror, it gives sufficiently effective illumination at a height 1000 feet above the ground to show objects 1100 feet ahead, obviating the necessity of landing floodlights in case of forced grounding.

Unquestionably, more powerful lights will be developed as emergency landing fields increase and airway traffic continues to grow. The installation of floodlighting equipment is costly and, consequently, if that can be obviated in the case of intermediate emergency fields by substituting adequate lighting equipment on the plane itself, such development will contribute significantly to the safety of night flying.

Proceeding to the second general classification, airway lighting, John F. Conway, deputy commissioner of the Bureau of Light-houses, states that about 6000 miles of airways are now lighted with about 1300 lights in operation. 1800 additional miles are under construction, embracing about 360 lights. Considering that this activity is only just entering its third year, this is commendable progress. The standard marking for air routes consists of intermediate landing fields at approximately thirty-mile intervals and beacons at ten-mile intervals. Variations from this standard occur where special conditions exist.

These airway beacons, however, are far from sufficient to meet the needs of the night

flier. Landmarks must be distributed throughout the country so that the pilot, lost on his way, can most readily return to the regular airway. To this end, the Aeronautic Branch of the Department of Commerce has issued an order, which becomes effective on January 1, 1929, prescribing the specifications for private aeronautic lights. "Private aeronautic lights," says the order, "located on civil airways, will be certified if of distinctive characteristics and of equal effectiveness to the department beacons. If the private light is a rotating beacon, it should run at six r.p.m. and be inclined approximately one degree above the general horizon, having the same general characteristics as the rotating beacons established on the national airways.

"Private aeronautic lights in cities not on these airways will be certified only if they have characteristics differing from those of aeronautic lights established on national highways or on landing fields, and serve as landmarks from which a departure can be taken to reach a safe, lighted, landing field. The characteristics must be such as to preclude the possibility of confusion with lights marking this landing field.

"In addition to the above requirements, all rotating beacon lights must be equipped with a fixed projector, throwing a narrow pencil of light for two or three miles in the direction of the nearest landing field. This projector must be at least 24 inches in diameter and furnished with a parabolic reflector, giving a high candlepower beam of

vately operated rotating lights, such as those used for advertising purposes, which may be confused with approved beacons and be the subject of complaints by air pilots, must be discontinued. They will be branded as false lights under the Air Commerce Act of 1926 and failure to place such lights out of service is subject to a five thousand dollar fine and five years imprisonment, as provided by the Air Commerce Act.

Mr. Paulus informs us that the 1000-watt Mazda lamp, operating on 110 to 120 volts, has a visibility of 20 miles under good conditions and is therefore well suited to private beacon service. Great extension and increases in the number of these lights are necessary to encourage general night flying.

In this connection, the lighting of airway route signs deserves attention. Floodlights, angle reflectors, or exposed lamp outlines may be used for the purpose. When floodlights or angle reflectors are used, the illumination should be of the order of about 15-foot candles over the entire surface. The exposed lamp type of illuminated sign can be installed very economically and it is, undoubtedly, the most effective method of lighting an identifying sign.

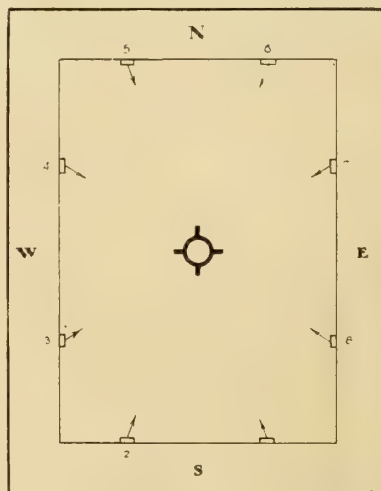
A booklet, issued by the National Lamp Works of the General Electric Company, entitled "Lighting of Airway Route Signs," gives a complete and effective exposition of this entire subject. Owners of large factories, looking forward to the day of heavy air traffic, are advised to take advantage of this new method of advertising which has the unusual quality of rendering a service to its new and growing field as well as fulfilling the more selfish purposes usually associated with advertising.

The booklet discusses in some detail the importance of adequate size and visibility. Since a pilot at a height of 2500 feet sees the horizon about 65 miles distant, he has, within his range of vision, an area of more than 7000 square miles. Within an angle of 45 degrees from straight down, he observes about ten million square feet and has but forty or fifty seconds in which to locate a sign, the area of which is likely to be but 500 to 200 square feet. Letters less than six feet high are not recommended. A comprehensive table gives the legibility distances for lettering 6, 10, 15 or 20 feet in height, consisting of 4, 6, 8 and 10 letters and lighted by 10, 15, 25 or 40-watt bulbs. For 6-foot lettering, a four letter sign, lighted with 10-watt bulbs, can be read at a distance of 2700 feet, while a 20-foot sign of ten letters, using the same type of bulb, is visible at 11,900 feet.

The choice of the size of lamp to be used is governed by the lighting conditions in the locality. Larger lamps produce a brighter sign which commands greater attention at the cost of legibility and this is of importance in locations adjacent to brightly lighted streets or near other signs. On the other hand, weaker lights may be used in dark districts with greater legibility.

Another table gives the number, size and location of floodlight projectors for painted signs and also for the angle reflector. A floodlight, having a 30 degree spread, is

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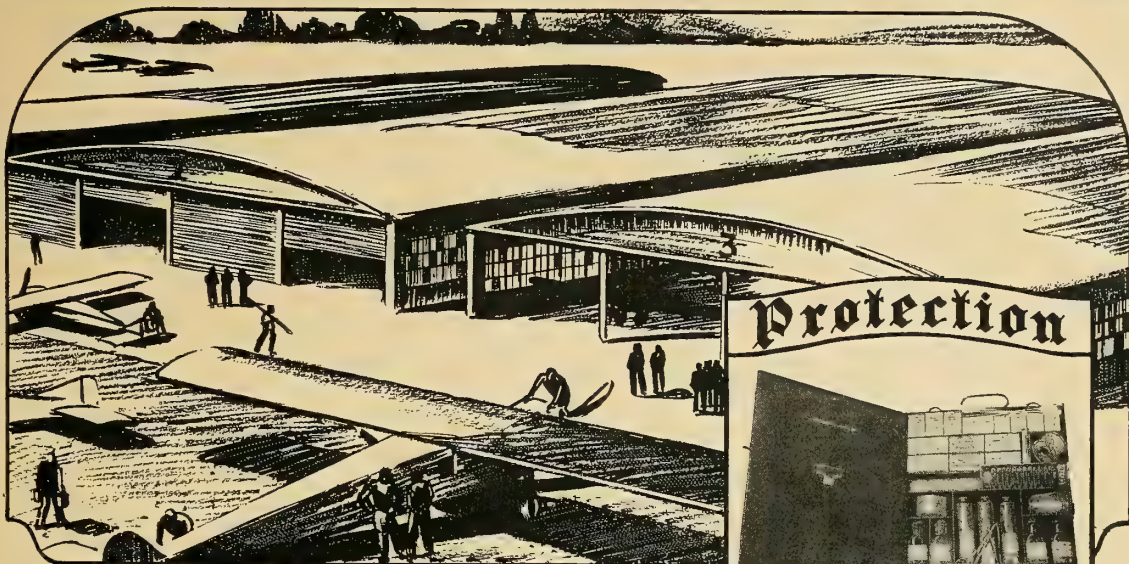


An airport floodlight layout, using eight projectors.

not over three degrees spread and equipped with a 32-volt, 600-watt, light source. The beam should be elevated sufficiently to clear intervening structures. Aeronautic lights must necessarily be reliable in operation between sunset and sunrise."

The regulation further provides that approved lights must be maintained in service and, in case of accident, the operator must immediately advise the airways division by wire of any cessation or failure in the operation of the light and the date on which the light is to be returned to service.

The Bureau further warns that all pri-



**Protection**

TRADE MARK 'TABLOID' BRAND  
FIRST-AID No. 744  
WALL TYPE CASE

## 'TABLOID' FIRST-AID— Indispensable To Airport Equipment!

List Price \$16

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on Quantity

**W**ITH the rapid development of airports nationally, there is a correspondingly active demand for 'Tabloid' First-Aid.

This reliable service may well be regarded as the ace in protection wherever it functions—whether on land or sea or in the air.

For more than half a century, 'Tabloid' First-Aid has been first choice of hosts of explorers, discoverers, prospectors, Military and Naval men, sportsmen, etc.

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Official Capacity.....



(Continued from preceding page)

well adaptable to this use. In order that the beam may cover the sign area, the projector should be mounted ten feet above the sign and about five feet back from the edge. Projectors, located at the two ends of signs, are suitable for signs up to 60 feet, but signs longer than this are more uniformly lighted by projectors grouped at the sides. The number, power and location of floodlights required for signs 25, 40, 60, 80, 100, 120 or 140 feet in length with lettering 6, 10, 15 and 20 feet high can be determined by inspection of the comprehensive table appearing in the booklet.

This booklet, "Lighting of Airway and Roof Signs," is a most comprehensive and satisfactory compendium of information and those interested in the subject should write to the engineering department of the National Lamp Works of the General Electric Company, Nela Park, Cleveland, for Nela Booklet X-3.

Airport lighting, the third general classification, is an extensive subject. Its requirements are rapidly growing. In general, we have to consider:

1. The revolving beacon;
2. The airport boundary light;
3. Obstacle lights;
4. The wind direction indicator; and
5. Airport floodlights.

Bulbs have been developed by both Westinghouse and General Electric, covering a wide range of powers and suited to both 110-volt and 32-volt systems. The latter are particularly useful in remote areas where a local generating plant must be used. In that case, the 32-volt farm lighting systems are readily available at low cost. For this service, 1500 and 3000-watt lamps are available while, in the 110-volt type, powers as high as five and ten kilowatts, giving tremendous illumination, are available.

An experiment which attracted a great deal of attention lately was the employment of a siren on a plane which automatically turned on the floodlighting, recently demonstrated by the Westinghouse Company. A sharply tuned, audio-frequency amplifier, actuated by a microphone system, selected the particular sound frequency of the siren to operate the lighting control relay. This particular method, we believe, has objections because an unfavorable wind may divert the sound energy from the plane's siren so that the system would not work reliably in a strong wind at distances which would normally be satisfactory. This problem, however, could be overcome by installing several microphones over a fairly well distributed area, so that, regardless of the direction and velocity of the wind, the siren would be effective. As important as the intensity of illumination itself is the control equipment available. Uncontrolled illumination may be confusing as well as assisting.

We are indebted to Mr. C. C. Young of the Engineering Department of the National Lamp Works of the General Electric Company for some interesting data regarding airport floodlighting. For the large, approximately square landing field, Mr. Young recommends a high intensity source, so lo-

lated that the pilot, when landing into the wind, will come in over the lighting unit. Because of shifting winds, a single light source is not sufficient to meet this requirement for all conditions. Therefore, eight powerful floodlights, preferably of the 10 kilowatt size, two located on each of the four sides of the field and suitably controlled from a central point, are preferable.

For the runway type of field, distributed illumination is preferable. In the accompanying illustrations, we show several ideal layouts which indicate the various suitable types of lighting equipment.

Mr. Young recommends that a degree of lighting at least comparable to that in the average home be provided at the airport, that is, at least one watt per square foot. "If, by putting good lighting on an airport," writes Mr. Young, "this new form of transportation can be advanced more rapidly, the meagre cost will certainly be justified, to say nothing about the savings in property loss and personal injury. The one thing to remember is that most pilots, now actively engaged in night flying, have years of experience back of them, some landing from the light of a gallon of distilled gasoline on the ground. Newer pilots have not this experience. Better lighting will help."

Some experiments have been conducted by Lieut. John Sherman Donaldson for lighting the runway and indicating wind direction. The lights are buried in the ground under heavy plate glass and, in the thousand-foot runway, spaced about fifty feet apart. A weathervane, indicating the direction of the wind, automatically controls the indicating light so that the pilot takes the most suitable course on the available runway in accordance with the wind condition prevailing at the time.

A possible objection to this system is the fact that it may not be feasible when there is snow on the ground, although, undoubtedly, some way could be provided, either by heating or some other means, to assure visibility during snow storms.

In addition to the searchlight type of beacon, considerable promise is shown by the neon type of lamp. Perhaps the most economical installation of this type is the neon induction lamp which gives the illumination of much more expensive types. Neon, because of its monochromatic character, is visible for much greater distances than white light and, because of its fog-penetrating character, is especially useful under conditions of poor visibility.

#### Airport Activities

CHICAGO'S municipal airport bids fair to earn the title of the busiest landing field in the United States. In addition to taking off or landing an average of 2000 passengers a month, the mail contractors have tripled the take-offs since January and doubled the mail poundage as the following table for the first ten months of the year shows:

Month	Landings	Take-offs	Pounds of
			Mail
January	576	562	91,480
February	747	762	76,648
March	1,033	1,012	101,408
April	995	1,002	92,257

May	1,610	1,617	118,446
June	1,612	1,558	114,224
July	1,690	1,618	120,225
August	1,605	1,654	170,156
September	2,627	2,595	192,957
October	1,805	1,654	170,166

120 acres of the 320-acre plot have been developed. Runways radiate in eight directions. There are 13 busy hangars on the field. The Boeing Air Transport and the National Air Transport carry the mail west and east respectively to the Pacific and Atlantic seaboard twice daily. The Universal Air Lines and the Northwest Airways send their passenger and mail service northwest to Minneapolis and St. Paul, while the National Air Transport serves Kansas City and Dallas from this point. The Embury-Riddle Company, the Stout Lines and the Gray Goose Lines also have their headquarters at this point, serving Indianapolis, Cincinnati, Detroit and other points. The estimated cost of developing this airport is ten million dollars and eventually it will pay the city handsomely.

IN a recent report, Assistant Secretary of Commerce for Aeronautics, William P. MacCracken, Jr., stated that there are 386 municipal airports, 340 private or commercial airports, 256 of the intermediate class, 62 operated by the Army, 70 by the Navy and 326 auxiliary fields for emergency landing. Altogether, there are 1387 landing fields listed. Of these, 400 are of standard type, where not only safe landing is provided but machinery for repairs, re-fuel and for the personal comfort of the men who travel by air. 890 additional airports are projected.

The number of civilian-owned craft in the United States numbers nearly 8000. Less than ten per cent of them are controlled by mail contract or air transport companies. Approximately half are owned by individuals and corporations who serve the public in the fields of aerial taxi, sightseeing, instruction and similar fields of endeavor. With this growth in the number of planes in operation, the demand for airport facilities has increased proportionately. Naturally, those cities which possess good airports attract air commerce. Mr. MacCracken holds the view that airports should be municipal enterprises, just as parks and highways are generally recognized as being within the province of the municipality. The Air Commerce Act of 1928 suggested this by providing for the transfer to municipalities of the airports established by the Post Office Department.

THE new Clover Field, to be opened at Douglas, Ariz., is the first international airport in the United States. A line separates the United States from Mexico, with officials of both countries to inspect ships both ways. The airport has been completed, but the official opening will not be held until the new \$500,000 hotel, now being erected, is completed.

TOTAL landing at the Oakland, Calif., airport during November were 5,541; passengers carried 3,350; and gross revenue \$3,422.09.

(Continued on next page)

# ROBERTSON HAS THE EXPERIENCE

## IN AIRPORT CONSTRUCTION . . . . . THERE CAN BE NO SUBSTITUTE FOR EXPERIENCE

Consider what experience means in this field.

In the building of airports, the construction business is afloat on strange, uncharted seas. A thousand new questions to answer. How can rust be prevented? What will a hangar cost? How can you secure a permanent structure that can still be moved to some other part of a field? How can you get inside daylight for mechanics to work in? These and a thousand other questions.

In this field, you cannot go to the textbooks with your problems; there has not been time for textbooks. The only rules are those of experience. The only men who know what to do about the problems are the men who have had actual experience in handling them.

For almost a dozen years, Robertson engineers have been working with these very problems. Helping to build hangars for the army, the navy, the marine corps; for city airports and for private flying fields. Since away back in the days when aviation was largely a military weapon and the Robertson Company was helping build military hangars near the French battlefields.

Today, you find construction companies that are old and wise in other fields of building coming to the Robertson engineers for advice about this special new field. Bring your problems to Robertson engineers. They will study your situation in the light of their experience and advise you, without cost and without obligation. Just write what you want to know.

### H. H. ROBERTSON COMPANY · PITTSBURGH



One of the many hangars with roofs and side-walls of R P M at Mitchell Field, New York.

## ROBERTSON *has the Experience*



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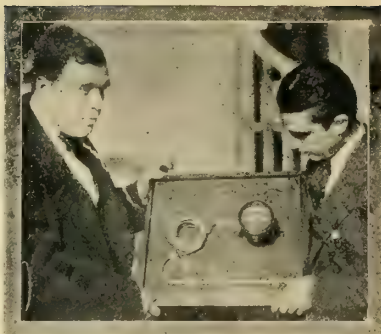
### With the Airlines

**I**N his annual report, Director of Aeronautics for the Department of Commerce Clarence M. Young gave figures which reveal the tremendous growth of air traffic and general aerial activities during the year. The Department has found its burden of licensing pilots and airplanes tripled within the last twelve months. Pilots in commercial service flew 30,000,000 miles during the year, creating a considerable traffic problem. Inspectors of the Department are jammed with applications for licenses and now use eight planes to make trips to fields and factories and will require 40 planes for their own transport during the coming months. By June 30, 1928, applications had been received for more than 5,500 pilots, 5,000 mechanics, 4,700 airplanes. In addition, 4,000 applications for student permits have been filed. Although there are 320 flying schools in operation, their facilities have been insufficient to take care of the demand for training.

**T**HE Aeronautics Branch of the Department of Commerce has announced the completion of the Los Angeles-San Francisco airway. The San Francisco-Seattle, San Francisco-Salt Lake and the Salt Lake-Los Angeles airways are in the process of construction, while the St. Louis-Omaha airway is under survey preliminary to construction.

**P**RESIDENT W. W. ATTERBURY of the Pennsylvania Railroad gave out the details for the coast-to-coast air passenger service to be inaugurated next spring by the Transcontinental Air Transport Company. The air-rail line will carry passengers between New York and the Pacific Coast in two days, virtually cutting in half the time of the present all-rail journey. Passengers will board a train at 6:05 p. m. in New York, spend the night in a sleeper, transfer to a plane at Columbus, Ohio, and reach Dodge City, Kansas, by day, making stops at Indianapolis, St. Louis, Kansas City and Wichita. After dinner, the air travelers will board a night train for Las Vegas, N. M., where a second plane carries them to the Coast with stops at Los Angeles and San Francisco. At a later date, the firm plans an all-air service from Columbus to the Pacific Coast, flying both day and night. Delivery of ten Ford trimotored transport planes, each equipped to carry twelve passengers, is expected by February 1. The cruising speed will be 115 miles an hour and the planes will be manned by a pilot, mechanic and steward. Each will be equipped for radio transmission and reception.

Following upon the announcement that the Pennsylvania Railroad has ordered ten trimotored Ford planes through its aerial subsidiary, the Transcontinental Air Transport, the Baltimore & Ohio Railroad announces the negotiation of an air-rail service with four other roads in conjunction with the Northwest Airways Company. This will provide air-rail service between New York,



Henry Boynton explains the Motometer Co.'s new ice-warning indicator to Bert Hassell, who flew to Greenland.

Philadelphia, Baltimore, Minneapolis and St. Paul.

Traveling time from New York to St. Louis is reduced by five hours and to Minneapolis and St. Paul by three through the new air-rail schedule inaugurated by the New York Central lines, in cooperation with the Universal Air Lines System, according to Louis H. Piper, its president.

Passengers board a night train for Cleveland, there transfer to planes for Chicago, St. Louis, St. Paul, Minneapolis or Rochester, Minn. This new service makes it possible for New York business men to reach these cities of the Central West with a loss of only half a business day. Similar schedules have been established for return trips to New York, with arrivals at the metropolis at dawn. All schedules allow time for meals and rest at junction points.

**I**N his annual report for the fiscal year 1928, Postmaster General New urged the extension of the air mail service under the contract system and the passage of legislation to extend air mail services to foreign countries and territorial possessions.

"Contracts for service have been awarded on ten additional routes and provision was made for extension of service on existing routes in a number of cases. During the year, \$4,057,093.94 was expended for this service and 5,585,224 miles were actually flown. Improvements in air mail service, put in operation during the year, include routes from Miami to Havana and from Seattle to Victoria, B. C."

**W**IRVING GLOVER, second assistant Postmaster General in charge of air mail, announced that, to promote trade relations between the United States and the countries of Central and South America, air mail service, stretching from Montreal to Buenos Aires in Argentine is projected. Two of the routes, connecting Miami with Colon, Panama Canal Zone, and with Trinidad, will be in operation within two months, while the third route, from Colon to Santiago, Chile, will be advertised soon.

**T**HE air mail service during November carried 421,174 pounds of mail, as compared with 141,282 pounds for November, 1927, and 37,686 for November, 1926. November, being a short month and including

a holiday, shows a decrease over the preceding month of October.

**C**ARRYING 124,191 pounds of air mail and 151 passengers, the Boeing air transport mail planes, flying between San Francisco and Chicago, covered a total of 177,742 miles in 1,771 hours and 47 minutes flying time, an average speed of 99.7 miles per hour, during the month of October. Total miles flown from July 1, 1927, to November 1, 1928, 2,240,167; total mail carried 1,005,314 pounds; total time in the air, 22,477 hours 29 minutes.

**C**OINCIDENT with the opening of the first International Aeronautical Exposition, the Interstate Airlines inaugurated its service connecting Chicago with Atlanta, with intermediate stops at Champaign, Evansville, Terre Haute, Nashville and Chattanooga. The take-off is at 9 a. m. with arrival at Atlanta at 5 in the evening.

### Aircraft Communication

**T**HE radio communications system, organized in connection with the Imperial Airways of England, maintains constant communication with all the planes flying en route. The range of the aircraft telephone equipment aboard planes is 250 miles, connecting the pilot with any airdrome or aircraft on his route within that distance. In bad weather, direction readings can be taken on his transmission in less than two minutes. Wind-driven generators and trailing aerials are used.

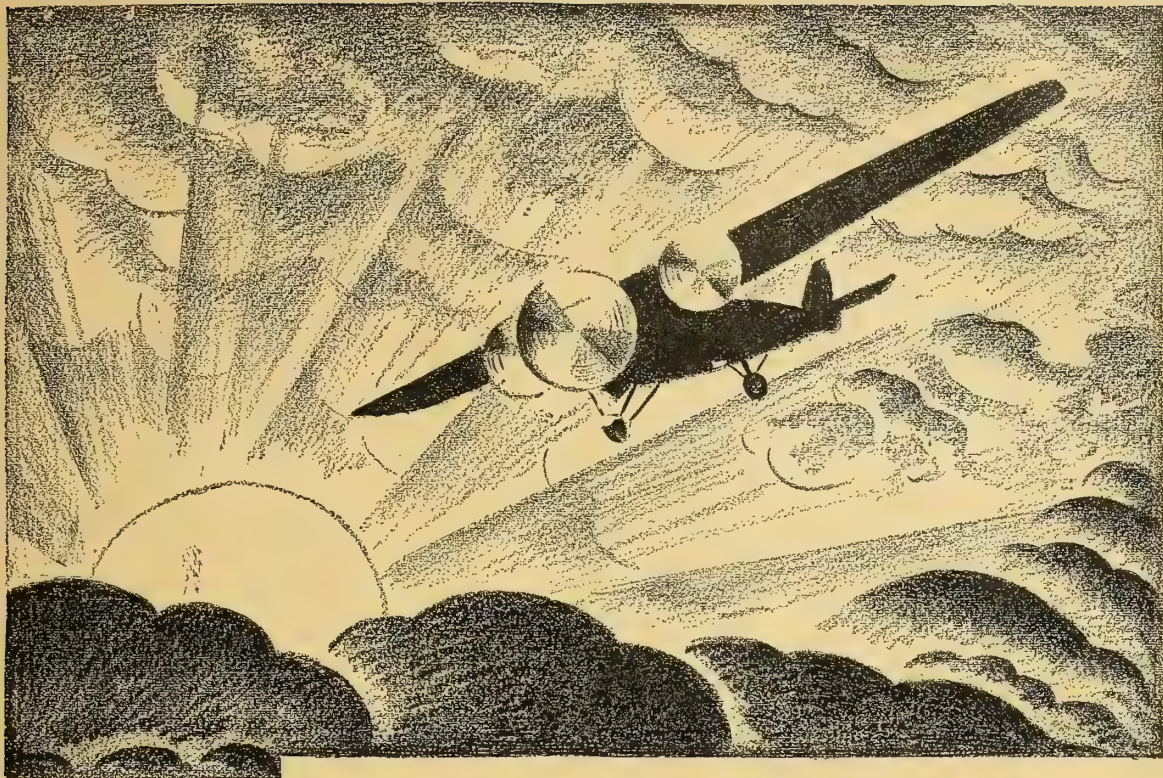
**C**APTAIN S. C. Hooper, U. S. N., Director of Naval Communications of the U. S. Navy, urges aircraft to employ the 600-meter wavelength for the sending of distress signals in order that they may be picked up by ships at sea and shore stations. He pointed out that the plight of the *Greater Rockford* in Greenland could have been avoided, had it been equipped with such a transmitter. Distress signals are lost in the high frequency spectrum.

**T**HE U. S. Army Air Corps has installed a complete flying radio laboratory in a Fokker trimotored monoplane. This flying radio laboratory includes at least two complete transmitting stations and five different designs of receiving sets which are subjected to exhaustive tests under actual flying conditions.

### New Devices

**T**HE Motometer Company of Long Island City, N. Y., has developed an ice warning indicator. This has a long metal rod, fitted with the leading edge of an outer strut and attached by a wire to a type of thermometer. The moment ice begins to form on the rod, and this is before it begins to appear on wing surfaces, the dial on the cockpit records it. The Pioneer Instrument Company has developed an air distance recorder, one that actually measures, through a venturi tube, the air distance flown. Another meter is the fuel flow meter which automatically keeps track of the gas supply.





# INTO THIS DAY *of* COLOR

From out of the conventional, precedent bound past, aviation sails into this day of color. The sky is alive with it. Striking colors are in evidence at every airport.

And why this change? Because color lends an atmosphere of smartness, efficiency and *Speed* to a plane. It allows for individuality. It attracts attention. It creates sales.

Nitro-Valspar, the modern *all-lacquer* finish brings to the airplane the same smart range of colors which have distinguished the recent progress in automobile design. And there is no more durable finish. Weather and quick temperature changes, vibration, gasoline or oil have no effect on a Nitro-Valsparred surface.

We will gladly send an experienced technical man to help solve your paint problems and advise on modern color application.

## NITRO-VALSPAR

VALENTINE & COMPANY, 386 Fourth Ave., New York, N. Y.







The L-B-Con airway beacon

## THE L-B-CON LIGHT

**A** NEW and distinctive airway beacon, L-B-Con, has been designed by Jack Bartow of Philadelphia, Pa., to facilitate flying in thick, foggy weather. As it rotates on an angle, the L-B-Con throws a beam 30° above the horizon and 30° below. The angle is adjustable to suit the locality of its use. Because this light has 360° lens, the beam appears first to rise to an angle above the ground and then descend to an angle below the ground. The 360° lens also makes it possible to see the light at all times from any position relative to it. This is a distinct advantage over the beacon which flashes intermittently, since its rays not only penetrate upward through fog, but its peculiar mounting results in a distinctive series of waving rays which are distinguishable from any other lights which may be in the vicinity of the landing place.

By stopping the rotating mechanism, the L-B-Con may be used as an emergency landing floodlight. It uses the same light source as the revolving beacon—1500 watts. A top lens mounting permits this beacon to be used as a ceiling light to indicate to the pilot the height of the haze above the ground.

This light was shown at the Chicago Aero Show last month.

## PHOMENE FOAM BRUSH FIRE PROTECTION

**T**HE Pyrene Manufacturing Company, in conjunction with the Minimax A-G of Berlin, has recently concluded extensive investigations of general aircraft fire hazards at the larger airports of America and Europe. As a result, the company has developed units of fire protection particularly suited to the several types of aircraft fire hazard.

Possibly the most unique and effective is the Phomene Aircraft Hangar Foam Brush. This unit is a development of the well known Phomene accumulator, manual or automatic protection for flammable liquid hazards, which was adapted first for use in extra hazardous yard risks, and finally adapted directly to the needs of the aeronautical industry in the protection of flying equipment in the process of manufacture or repair, or in the hangar under normal operating conditions.

The Phomene Foam Brush is built in units capable of adequately protecting 10,000 square feet of enclosed hangar space, plus an amount of apron area of about 40 feet around the hangar. It consists of two parts: the foam producing unit, and a series of operating stations.

The foam producing unit is the Phomene Accumulator Model 2802 which is placed in any convenient place, preferably where it will not interfere with the aircraft operation. It may be in an office, a repair lean-to, in an alcove, or in the roof structure. The accumulator is attached to the regular water supply. It requires a water pressure of twenty-five pounds or more, and will use a  $\frac{3}{4}$  inch pipe of supply, although the connections should not be less than  $1\frac{1}{2}$  inches. It will when operating, produce from 2,500 to 2,700 gallons of foam, and will make this delivery at the rate of from 800 to 1,200 gallons per minute, depending upon the water pressure. With 60 pounds pressure, it will deliver at the rate of 1,000 gallons per minute.

If more than one operating station is serviced by a producing unit, the latter is equipped with a selective foam operating

valve which automatically starts the generation of foam in the unit and at the same time routes the foam to the proper operating station.

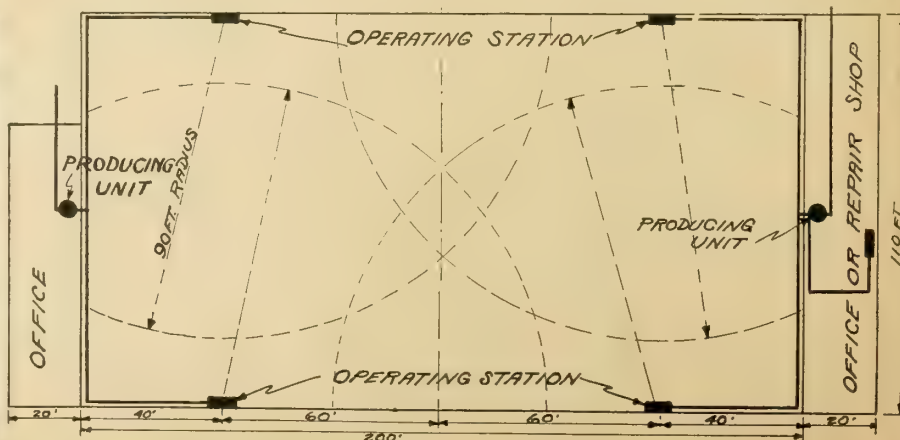
Foam is led from the producing unit to the signaling operating station through a system of three-inch pipe lines.

The operating stations are distributed about the walls or posts of the hazard area, so that any point within that area may be reached by the foam brush stream. The stations are designed with two objects in view; i.e., to have their services available in the least number of seconds after contact therewith, and to take care of the particular needs of aircraft operating conditions.

The station consists of a hose basket, a hose, a hose nozzle, and a signal operating mechanism connected to the selective valve at the producing unit.

The hose is conveniently coiled within a basket so it may be removed the more readily. The hose, which is only twenty-five feet long, is of the three-inch double jacketed rubber lined style to allow for the continued smooth production and delivery of the foam. Its short length allows for a minimum time loss in straightening out for delivery, and also considers the crowded condition in which the hangar may be. The nozzle has a two-inch opening with a long bore allowing for utmost smoothness of the stream. A delivery of twelve hundred gallons of foam per minute through this size orifice will give a stream range of approximately 65 feet.

The operation is as follows: The producing unit is standing by ready charged with Phomene foam making powder, and connected to the city water supply. Upon detection of a fire, an operator runs to the nearest operating station and pushes in the contact button. A pneumatic impulse is thereby transmitted to the selective operating valve which opens that foam valve leading to the particular operating station. Immediately after pushing the button, the operator at the station takes the hose by the nozzle and literally kicks it clear of sharp kinks. In about six seconds from the time the button is pushed, a full stream of foam is pouring from the nozzle.



The Phomene Foam Brush fire extinguisher and a diagram showing the arrangement of the Phomene System.



You are *never* far from  
your next tankful of SOCONY

**Y**OU'LL find Socony Aviation Gasoline and Aircraft Oil almost everywhere in New York and New England. Even in emergency landings, you can count on the Socony truck to arrive first.

Aviators have learned, like motorists, that Socony stands for quality products—available all over New York and New England.

In the Southwest use the products of Magnolia Petroleum Company, and on the Pacific coast standardize on General Petroleum Corporation products. These are two important subsidiaries of Standard Oil Company of New York.

**SOCONY**  
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**AVIATION GASOLINE—AIRCRAFT OIL**

**STANDARD OIL COMPANY OF NEW YORK**



# TECHNICAL

## LOCKHEED PLYWOOD CONSTRUCTION

THE process by which plywood fuselages are made at the plant of the Lockheed Aircraft Company of Los Angeles, and for which the company controls exclusive patent rights, was developed several years ago by Malcolm Loughhead, Allan Loughhead, Anthony Stadlman, and John K. Northrop, the latter three men now being in active charge of production at the Lockheed factory.

The method used produces a perfect half-shell or body, molded from three layers of vertical grain spruce and glued at one time under heavy pressure to form a perfectly homogeneous unit.

In proceeding with the structure, the body lines are first laid out to give the required cargo space, with an elliptical central cross section, tapering gradually to a circular section in front and a small ellipse in the rear. A wooden form is then constructed to the exact shape required for one half the body when divided on a vertical plane, passing through the center line. This form is carefully finished, and is rigid and well braced. It is next suspended with its formed or curved surface downward, in a large box in which reinforcing bars have previously been woven, and which is filled with a good grade of concrete, carefully tamped, to produce a smooth cast surface against the wooden form.

After the concrete has thoroughly hardened, the box sheathing is removed, the wooden body form lifted out, and the result is a reinforced concrete block weighing from 10 to 30 tons (depending on the size of the fuselage) and having a central depression which is just the shape of one half of the finished fuselage.

Special alloy steel bolts are cast into the concrete at intervals of about two feet along the edge of the form, and a wooden cover is fitted flush with the top of the concrete, and is held in place with heavy steel I beams passing over the hold-down bolts.

By

Lieut. Norman S. Hall

The remaining requirement for the quantity production of fuselage shells consists of a large rubber air bag which is fastened to the cover, and which fills the depression in the concrete.

The Lockheed fuselage shell is made of three layers of sliced, vertical grain spruce veneer, totalling when complete, between 5/32" and 3/16" thickness. The inner and outer layers are about 1/24" thick, and run longitudinally from nose to tail, while the center ply is 1/16" spruce with grain at right angles to the other two layers. The longitudinals are gore-shaped strips tapering from approximately 1" wide at the ends to 6" at the center. They are stacked in bundles, clamped between forms, and cut to the required shape about 30 at a time. Each piece is 25 feet long, and since sliced spruce in this length is not available, a special splicing machine has been built which produces a perfect scarf splice about 3/4" long in 1/24th veneer.

After cutting to shape, the longitudinal gores are temporarily fastened in position on the original wooden body form by means of a few tacks, and are secured in the proper relation to one another by strips of paper tape fastened along the joints. The inner and outer longitudinal plies are all made up in the same manner, and after preparation may be folded up and stored until ready for use. The transverse layer is also laid up over the wooden form, the ends being fastened to a transfer ring, which is a 2x3 band of laminated spruce carried around the edge of the wooden form, and so arranged that it may be removed as a whole, when necessary.

When it is desired to assemble a shell, the outer layer is placed in position in the

concrete mould, being held in place by strips of gummed tape along the edge of the mould. It is then given a coat of casein glue, while at the same time the second or transverse layer, in place on the wooden form, is coated.

The second layer is then picked up as a unit by means of the transfer ring, and is inverted in the concrete mould inside the first layer. The second layer is in turn coated on the inside, while the last or inner layer is placed inside the other two, in the concrete mould, the cover lowered and bolted down by means of I beams and bolts in the concrete; and air pressure applied to the rubber bag which fills the space between the plywood shell and the cover.

While the description of the process is quite lengthy, the actual time required is very short, and it is only about 20 minutes from the application of the first glue until the whole shell is under pressure of from 15 to 20 pounds per square inch, the total pressure exerted being about 150 tons over the whole sheet of plywood.

Any slight irregularities in the concrete mould, or in the thickness of the plywood are taken up by the resilience of the rubber bag, so that every inch of the plywood surface receives exactly the same pressure. The shell remains under pressure in the concrete mould for about 24 hours. It is then removed, and placed on a drying rack where the excess moisture is removed. The resultant half shell is a homogeneous piece of plywood, without joints, cracks or laps, perfectly glued throughout, and formed to the exact streamline shape desired.

The skeleton framework to which the shell is applied consists of a series of elliptical, laminated spruce rings, varying in cross section from almost three inches square, where heavy loads are applied, to about 3/4 inch square back near the tail of the fuselage, where the loads are light.

The rings are held in the proper position by four light spruce strips or longerons which serve as spacers, and at the top and bottom as seam strips on which the two half shells are joined.

The monocoque shells are clamped in position on the "skeleton" by means of special strap type clamps, and automatically align themselves on the framework. They are glued and nailed in place with barbed cement coated brass nails, care being taken that at points of large load ample gluing and nailing area is provided. Cutouts are made for windows, doors, cockpit openings, etc., and reinforcing members are used around the larger openings to replace the material strength removed at the cutout points. Paint or lacquer outside, and the installation of seats, controls, baggage compartment, and upholstery inside, complete the structure.



The Lockheed Vega used by Wilkins on his Antarctic Exploration

# THE "SENIOR" BUHL AIRSEDAN



The latest model of the AIRSEDAN equipped with Wasp, Hornet or Cyclone engine. An eight place commercial cabin airplane equipped with dual controls and incorporating the same characteristics for which the AIRSEDANS are popular.

Comfortable, heated, soundproof, easy-conversation cabins are characteristic of all Buhl AIRSEDANS.



*The Buhl Airsedan*

Built for operators and corporations whose executives must fly to fulfill important engagements.

The pilot's compartment is separated with a partition so that conversation can be carried on without interference.

Equipped with Wright Whirlwind engine and licensed to carry a useful load of 1,628 lbs. High speed, 120 M.P.H.



*The Buhl Sport Airsedan*

For those who desire the maximum in performance and the cleanliness, comfort and sociability of the closed cabin.

Built either single or dual control with space for two passengers and an ample baggage compartment.

Equipped with a Wright Whirlwind engine this model has made 139 M.P.H. and is licensed for 1,400 lbs. payload.

## STANDARD EQUIPMENT (all models)

Self starter, brakes, metal propeller, compass, air speed indicator, navigation lights, tachometer, altimeter, clock, fire extinguisher, fuel, oil pressure and oil temperature gauges, air corps throttles, strainer and fuel valve, exhaust manifold and cabin heaters.

### DISTRIBUTORS

California:	Buhl Pacific Co.	—	—	Los Angeles, California
In the Northwest:	Mamer Flying Service	—	—	Spokane, Washington
Ohio:	Johnson Flying Service	—	—	Dayton, Ohio
Massachusetts:	Wetmore-Savage Aircraft Co.	—	—	Boston, Mass.
Eastern Canada:	National Air Transport	—	—	Toronto, Canada

**BUHL AIRCRAFT COMPANY**  
**Marysville, Mich.**



# THE ROHRBACH ROMAR

**T**HE latest production of the Rohrbach Metallbauten G.m.b.H., Berlin, Germany, is the Romar, a three-engined flying boat with cantilever wings. This plane was designed for the transport of twelve passengers and a crew of four. It is an all-metal ship, the construction material being mainly duralumin sheeting, strips and open-profiled pieces. The fittings and bolts of the detachable parts are of steel, and the gas and oil tanks of sheet brass. The plane is of the monocoque type.

The fuselage is composed of a large number of transverse bulkheads, which are connected by four longitudinal beams and an angle piece (which forms the keel of the hull). The cover sheets are riveted to these pieces. As far back as the step, the hull has a pronounced Vee shape, which diminishes aft of the step. The boat is divided into a number of watertight compartments and will remain afloat even if any two of them should be flooded.

In the bow of the hull, the first watertight compartment remains unused as a safety factor in the case of collisions. The next compartment is the radio and navigation room, which contains, besides the radio equipment, a chart table and two folding seats. Then comes the all enclosed cockpit. Aft of it and a little higher is located a small room for the mechanic. It contains a dashboard with the instruments and the Bristol starter, which also drives the bilge pump. The next two watertight compartments constitute the passenger cabin. In the first compartment are four seats and the lavatory; in the second, eight seats. The following compartment contains the hatch and steps which give access to the boat. Aft of this is the baggage and freight room.

The pair of wings has a large dihedral. Each wing consists of a box type beam, to which rib boxes are hinged. Some of the latter serve as fuel tanks. A passage enables the mechanic to crawl into the wing to inspect the engine controls.

The construction of the empennage is very similar to that of the wing. The control gear avoids the use of cables by working by means of levers and rods throughout. Dual control is provided. The compensation device of the elevator and rudder can be operated at will.

The two lateral floats, fitted under the wings, resemble the hull in shape and construction. The struts attaching them to the hull are streamlined.

The three geared B.M.W.VI engines of 500 to 720 horsepower each are mounted in streamlined nacelles at a considerable height above the wing. The fuel is fed to them by engine-driven pumps. The feeding tubes and engine control rods are conducted in the struts from the wing to the nacelles. Each engine has its own fuel tank, but distributing fuel from one tank to another is possible during the flight. The engines are equipped with Bristol starters, compressed air starters being provided for emergency.

The most up to date instruments are

standard equipment, as well as a direction finding apparatus, radio equipment for telegraphy and telephony, and an auxiliary radio set for transmitting while the ship is afloat. The plane can be transported on land by means of three beaching chassis; it may also be lifted out of the water by a crane, for which case four rings are fitted to the hull.

The crew comprises a pilot, navigator, mechanic and radio operator.

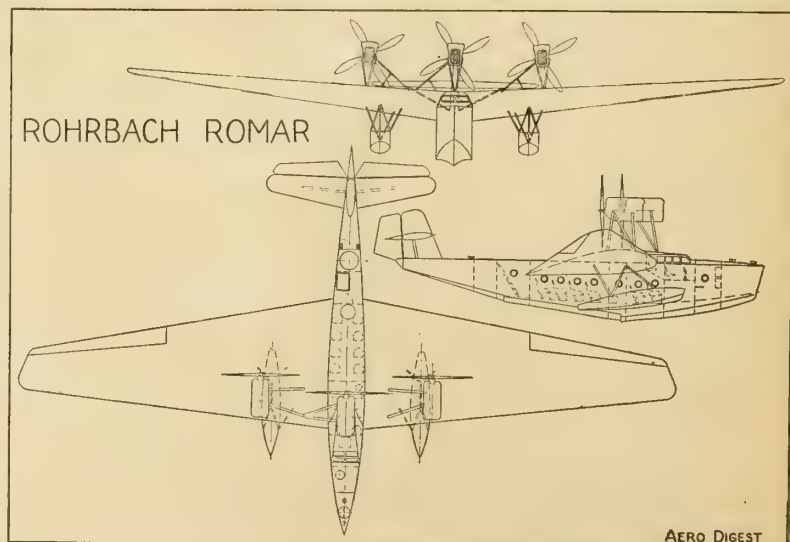
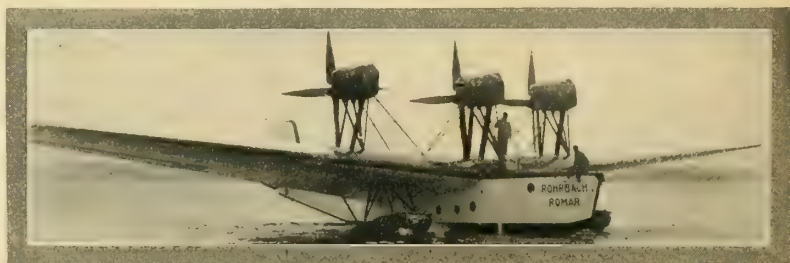
The ship flies easily on two engines even in bad weather. The taking-off times measured are very interesting: taking-off time 19 seconds with a gross weight of 29,800 pounds; 29 seconds with a head wind of 7 miles per hour and 33,700 pounds gross weight; 40 seconds with a head wind of  $4\frac{1}{2}$  to 7 miles per hour, a gross weight of 27,800 pounds and one lateral engine not running.

Three ships of this type have been or-

dered by the Deutsche Luft-Hansa. They will be used, it is rumored on an experimental route to South America.

## Specifications

Span .....	121 feet $4\frac{1}{2}$ inches
Length overall .....	72 feet $4\frac{1}{2}$ inches
Height .....	28 feet
Wing area .....	1,820 square feet
Weight empty .....	21,830 pounds
Weight of instruments, equipment & .....	3,310 pounds
Weight of fuel .....	13,510 pounds
Pay load .....	2,380 pounds
Gross weight loaded .....	41,900 pounds
Fuel capacity .....	1,740 gallons
Oil capacity .....	88 gallons
Range .....	(26 $\frac{1}{2}$ hours) 2,500 miles
High speed (fully loaded) .....	129 miles per hr.
Cruising speed .....	110 miles per hour
Absolute ceiling (fully loaded) .....	9,200 feet
Climb (fully loaded) .....	3,300 feet in 8.6 min.



# Piling up the Proof



Mr. Walter H. Beech, Pres.,  
Travel Air Manufacturing Co.,  
Wichita, Kansas.

November 10, 1928.

Dear Mr. Beech:

The splendid day to day performance of the Travel Air biplanes in Parks Air College, as revealed in a recent recapitulation of our flying log, may be of interest to you and I give you herewith some of the high lights of the record supporting a conclusion to which I have long since arrived. Namely, that Travel Air makes the finest, safest and sturdiest commercial airplane now in production anywhere.

Since we began operations on March 21 at the Parks Airport, in the St. Louis Metropolitan District just south of East St. Louis, we have purchased 39 ships from your company. Some of them we have used in our training program and others we have sold. At the outset we used four ships in our flying school, today as I write this letter there are 19 of your OX-5 jobs on the line and in the air. It goes without saying that these ships and the others we have used have taken a terrific amount of rough handling at the hands of our students, particularly in the early stages of their training. Since the early part of the past summer we have at all times had more than 200 men in our flying classes - today for instance, we have 229 so that you can understand that the ships are kept in the air during all the daylight hours. In addition, some of them have been used for night flying since the installation of our flood lights.

I find on going over our log that from March 21 to October 30 our ships flew a total of 6,535 hours. Approximately 48 percent of the time was taken up by solo students, yet during that period we have had only one crack-up, a minor one in which the repair bill was \$650.00. That represents our sole crash expense. Our only injury has been a fractured finger suffered in starting an engine.

During that period there has not been a single structural failure. Undercarriages, which come in for a major share of beating on training work, have stood up perfectly. During our most active month, July, we piled up the total of 1,351 airplane hours flying time without a single forced landing. Since we began our operations forced landings from all causes totaled only 21, or less than 1 to every 300 hours. It is interesting to note that we did not come upon Travel Air by chance. We have tried other ships and found them wanting. All in all we find that Travel Air is not only the sturdiest ship we can find but the most maneuverable, the safest and the one most suited for all around training work, not only for airdrome flying but for the cross country travel with which our students are graduated.

Yours very truly,  
PARKS AIR COLLEGE, INC.

*Oliver F. Parks*  
Vice President.

O.L. Parks-GB

THE STORY OF TRAVEL AIR ON REQUEST

## TRAVEL AIR MANUFACTURING CO.

The Standard of Aircraft Comparison  
WICHITA, KANSAS



# THE BUTLER BIPLANE

**T**HE Butler biplane is a two-place ship manufactured by the Butler Aircraft Corporation, Kansas City, Mo. This plane was designed for the installation of the 200 h.p. Wright Whirlwind engine, but other approved power units may be installed if so desired. Standard steel propeller is regular equipment.

Exceptional rigidity is attained in the wing construction through the employment of one-piece beams of spruce, selected in accordance with Army specifications, metal internal bracing and tie rods. Metal streamline struts and wires comprise the external wing bracing. Leading wing edges are Dural covered. Push-pull tubes operate Frese ailerons. Wiring for navigation lights is installed in the wings and fuselage.

Fuselage construction is of steel tubing throughout, each member containing the particular kind of steel best adapted to withstand the strain imposed upon it, with an ample factor of safety allowance.

Tail surfaces are of all steel construction. Stabilizer adjustment is conveniently located in the pilot's cockpit. Fin is adjustable for torque and rotating slipstream. The tail skid is detachable and has a removable friction shoe of hardened steel.

The landing gear is cushioned by 30 x 5 straight side casings and oilhydraulic shock absorbing struts, giving smooth landing and

taxiing free of racking even over rough ground. To facilitate ground control, internal expanding brakes are applied singly or together by pressure on foot pedals in the pilot's cockpit.

The pilot's seat is the parachute type and adjustable in flight. Throttle control is located for right or left hand operation in the pilot's cockpit. Dual control is standard equipment. Cockpits are leather upholstered, with cowling and windshield offering ample protection.

Alemite lubrication is provided for at all major chassis bearings. Many steel parts are cadmium plated. Steel members throughout are treated for both internal and external protection against corrosive action.

A magnetic compass, an air speed indicator, an oil pressure gauge, a temperature gauge and an altimeter are conveniently arranged on a panel in the pilot's cockpit. Gasoline strainer and fuel control are also located in the pilot's cockpit. The plane is equipped with a fire extinguisher and a first aid kit. The plane is to be produced in several color combinations.

## Specifications

Span upper wing .....	34 feet
Span lower wing .....	30 feet
Total wing area .....	310 square feet
Overall length .....	24 feet 6 inches
Maximum height .....	10 feet

Wheel tread .....	7 feet 6 inches
Gasoline capacity .....	70 gallons
Oil capacity .....	8 gallons
Normal pay load .....	400 to 500 pounds
Gross weight .....	2,650 pounds
Power loading (J-5 AB)	

13.25 pounds per h.p.

Wing loading .....8.06 pounds per sq. ft.

## Performance (fully loaded)

Maximum speed .....	130 miles per hour
Cruising speed .....	110 miles per hour
Landing speed .....	42 miles per hour
Rate of climb .....	1,400 feet per minute
Service ceiling .....	14,000 feet

## HOW MICARTA PROPELLERS ARE MADE

**M**ICARTA propellers are constructed of a specially woven fabric impregnated with a phenolic resin and formed in a mold under heat and pressure to exact size. Shaping by means of this mold eliminates errors of hand shaping, and insures uniformity.

In the manufacture of these propellers, the impregnated cotton fabric is cut in templates and is built up layer on layer. These layers of fabric are then accurately measured, and adjustments are made by removing or adding layers. About 220 laminations make up one propeller.

The pile of fabric is next placed in a highly polished bronze mold and heated by steam, a pressure of several hundred tons being applied. The heat and pressure are applied until, after several hours, the laminated fabric has become solidified and uniform. After cooling, the propeller is taken from the mold, and the small burrs and "fins" incidental to molding are stripped off. No other finishing is necessary, for the propeller in molding takes on the smooth finish of the surface of the mold.

The propeller is then sawed through the middle of the hub, making two separate blades; the hub end of each blade is rough machined to fit a steel balancing arbor, after which a preliminary check of the balance is made. The hub end of the blade is then machined to fit the steel hub, and a final balance taken. Each blade is balanced separately against a master blade, thereby making all blades interchangeable. At the same time that it is balanced, each blade is checked for angles, track, width, thickness, and possible surface defects.

One of the features of Micarta propellers is the adjustable pitch construction. This permits changing the blade angle adjustment by means of the clamp rings. Adjustments can be made with an ordinary wrench. A low pitch setting will allow the engine to turn up fast, permitting quick take-off. This is particularly desirable when leaving a small field. A high pitch setting can be used to hold the engine speed down at full throttle for fuel economy. If high cruising speed is desired, the blades can be given an intermediate setting. All Micarta propellers have a marked scale on the hub to allow pilots to change the pitch on the field.

The density of Micarta is approximately one-half that of aluminum. A propeller for a 150 to 210 horsepower engine weighs 54 pounds.



Views of the open cockpit Butler biplane

# SCORPION 4 IN LINE AIR COOLED

4 $\frac{5}{8}$ " BORE BY 5" STROKE  
100 H.P.—1800 R. P. M.

## SALIENT FEATURES

Low Center of Gravity

Clear Vision

Perfect Balance

60% Less Air Resistance

Control of Cooling for  
any and all Flying  
Conditions

Reliability—Accessibility

## POWER ASSURANCE



REGISTERED TRADEMARK

## AERONAUTICAL PRODUCTS

CORPORATION

MANUFACTURERS

NAUGATUCK, CONN., U.S.A.



## FOKKER F-11 AMPHIBIAN

**T**HE new Fokker Amphibian is one of the few monoplane amphibians developed up to the present time. In general, it is a flying boat with an all-metal (duralumin) hull, developed from the experience gained on several previous Fokker flying boats, combined with the usual design of Fokker veneer-covered full cantilever wing mounted on top of the hull. It is powered by a Pratt & Whitney Wasp engine with a three-bladed Standard Steel pusher propeller. The engine is mounted with its oil tank and accessories in a streamline mount on top of the wing. Eclipse hand inertia starter with booster magneto is used.

In the arrangement of its hull, the Fokker amphibian is a true flying yacht, its layout closely approximating that of the finest cabin cruiser. The ship exhibited at the Chicago Show is completely equipped with sleeping berths, gun racks, fishing tackle, a camping outfit, etc. The main passenger cabin, in the front part of which the double pilots' cockpit is also situated, has a total length of 15 feet and an average width of 5 feet. The front half of the cabin, immediately behind the pilots' seats and as far back as the front spar of the wing, is high enough to permit one to stand upright. Sliding safety glass windows are fitted throughout. Entrance is gained to the cabin through a door located at the front and just behind the pilots' seats. The passenger cabin can be furnished in many ways, varying from the usual transport airplane double row of seats for 6 to 8 passengers to the arrangement of a regular yacht cabin with table and lounge seats. The interior is paneled in mahogany. Immediately aft of the main cabin is a smaller compartment suitable for baggage, toilet, radio operator's cabin or galley, as may be desired.



Another compartment with portholes aft of this service compartment can be fitted with bunks and used as a sleeping cabin when the ship is at rest on the water. There is a hatchway in the roof of this cabin which permits it to be used for the crew if desired, so that they go forward to the pilots' compartment, ashore or up to the engine without passing through the main cabin.

The pilots' cockpit is well arranged, with a complete dual control, consisting of rudder pedals and a swing-over wheel. Standard equipment includes adjustable stabilizer, brake controls acting independently on each wheel through rudder control for steering. An arrangement is provided for setting both brakes by hand for use while starting and testing the engine. In the rear compartment, provision has also been made for the installation of a standard outboard motor to facilitate maneuvering on the water in difficult locations and for use in an emergency.

The tail surfaces are of steel tube and fabric construction. The fin, however, is thick and built of duralumin integral with the hull.

The combination of sponsons or stub lower wings of duralumin for lateral stability in the water, with the disappearing wheel landing gear, is an original design in the Fokker

amphibian. While the ship is on the water, the sponsons are approximately horizontal. By an arrangement of hinges in the landing gear shock absorber strut and axle, the wheels can be raised so that they lie horizontally, in a recess in the tip of the sponson. The head resistance with the wheels folded up is very greatly reduced as compared with a plane with land undercarriage or an amphibian with the wheels down. In this latter position, the sponsons, which are hinged to the chines, slope downward and form the equivalent of a streamlined axle and radius rod. The landing gear is of steel tube construction. Wheel track is 14 feet, 5 inches. Wheels are fitted with 36 inch by 8 inch tires; they have internal expanding brakes.

The shock absorber strut connects the end of the hinged sponson with the front wing spar, as in several types of Fokker landplanes. The shock absorber device itself consists of individual Rusco rubber rings, as used on the Fokker Super-Universal and F-VII.

The gasoline tanks, which have a standard capacity of 126 gallons or sufficient for six hours at cruising speed with a Wasp engine, are mounted in the wing as in the Super-Universal and F-VII. Fuel is fed to the engine by an engine-driven pump or by an emergency hand pump.

Instruments include a magnetic compass, altimeter, airspeed indicator, tachometer, oil pressure gauge, gasoline pressure gauge, oil thermometer, and switch.

The finish is as follows: wing, chrome yellow finish; hull, black asphalt bottom paint up to water line; upper part, navy gray; tail surfaces, chrome yellow lacquer; exposed metal parts, black lacquer; engine cowling, bright "whirl" finish, protected by transparent lacquer.

### Specifications

Span .....	59 feet
Length overall .....	45 feet
Height overall .....	13 feet
Area of wing .....	500 square feet
Weight empty .....	4,000 pounds
Useful load .....	2,350 pounds
Crew (two) .....	340 pounds
Gross weight loaded .....	6,350 pounds
Gasoline capacity .....	126 gallons
Oil capacity .....	12 gallons
High speed .....	125 miles per hour
Cruising speed .....	100 miles per hour
Landing speed .....	50 miles per hour
Rate of climb .....	950 feet per minute
Range .....	(5 hours) 500 miles



Anthony Fokker in the cabin of the new type F-11 amphibian.



# AIRPLANE Mechanics and Engine Experts Needed!

## A Job for Those Who Enroll During January

Over 100 airplane factories promise to build 15,000 airplanes in 1929! Thousands of new dealers, distributors, airports, transport and express companies will open. From 75,000 to 200,000 air mechanics will be needed. And there are less than 4,000 licensed airplane mechanics in the whole United States today!

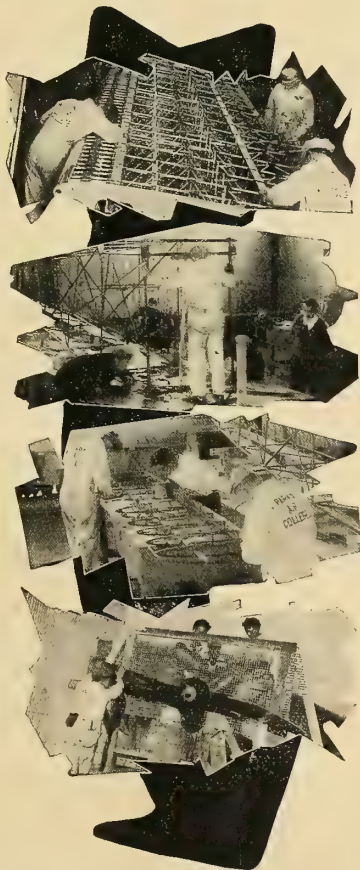
No wonder salaries are high! No wonder experienced, thoroughly trained airplane experts have no difficulty in finding good jobs at high pay and receive fast advancement.

And now Parks Aircraft, Inc., the new \$2,000,000 Manufacturing Corporation, agrees to give every man who enrolls in the Airplane and Engine Mechanics Course during January a job in the plant, in turn, upon graduation!

There are no strings to this offer except that you reach school in January! The first \$175,000 unit of the Parks plant is up—the first ships are in the air! But men are needed—badly—or production cannot go on!

Get into this fascinating profitable industry. Get yourself a position that leads to salaries of \$300 to \$500 per month—and leads upward to salaries of \$6,000 to \$25,000 per year as superintendent, production man, factory executive or transport engineer!

Since it costs *no more* to receive Parks training on nearly \$200,000 worth of equip-



ment, under skilled instructors—you should investigate this training given by the largest and most elaborately equipped civilian aviation school in the world.

At Parks Air College we have Whirlwinds, Caminez, OX5, Liberty, Hispano-Suiza, Velie and other latest motors. You tear these down, repair them, build them up, and test them.

You learn all about airplanes and engines. You actually build airplanes complete, piece by piece.

You learn factory production methods; become qualified for field duty, factory jobs, foreman's and superintendent's positions!

You get field duty on the flying line where you are entrusted with the responsibility of keeping a certain number of airplanes in the air. The Parks job-way system gives you training under actual factory and transport conditions!

### PRICES GOING UP!

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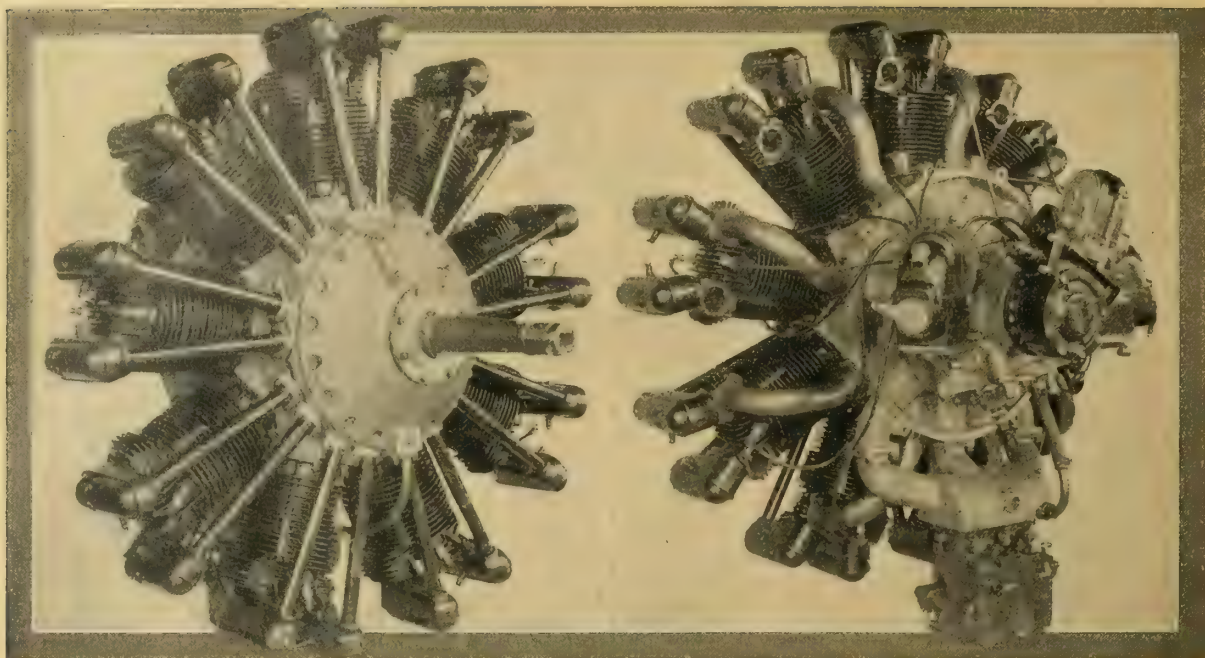
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## VELIE L-9 AIRCRAFT ENGINE

**T**HE Velie Motors Corporation of Moline, Illinois, are now in production on their nine-cylinder radial air-cooled 180 h.p. engine.

After one hundred hours' block testing, the initial engines were installed in various ships, including the Travel Air and the Monocoach, the latter of which is a four-place cabin ship and cruised at 95 m.p.h. and a top speed of 125 m.p.h. was attained fully loaded.

The Model L-9 has a bore of  $4\frac{1}{2}$  inches and stroke of 4 inches, giving a piston displacement of 644 cubic inches. The compression ratio is 5.2 and develops 180 h.p. at 1900 r.p.m.; sea level h.p., 160 at 1800 r.p.m. The weight of the engine dry without hub or starter is 477 pounds or 2.66 pounds per h.p. The overall diameter is 43 inches and length, including starter, is 40 inches.

The fuel consumption is .55 and the oil consumption .035 pounds per h.p. per hour.

The cylinder head is a Lynite aluminum alloy casting with integral cooling fins, incorporating a dome shaped combustion chamber with two Champion spark plugs, one in front and one in the rear, diametrically opposed. Aluminum bronze valve seats are shrunk into the heads, for the tulip type intake and exhaust valves of high temperature resisting silchrome alloy steel. At the right side of the head, looking forward, is the intake port and opposite is the exhaust port, leading to manifolds in the rear.

The valve mechanism consists of push rods and rocker arms, each rocker arm operating on two SRB ball bearings and lubricated by Alemite Zerk fittings. The rockers are supported by and enclosed in a cast aluminum alloy box attached to the cylinder head by three studs. The rocker arms have roller

followers in contact with valve stems and are actuated by push rods housed in aluminum tubes. The cylinder head is shrunk and bolted to the cylinder.

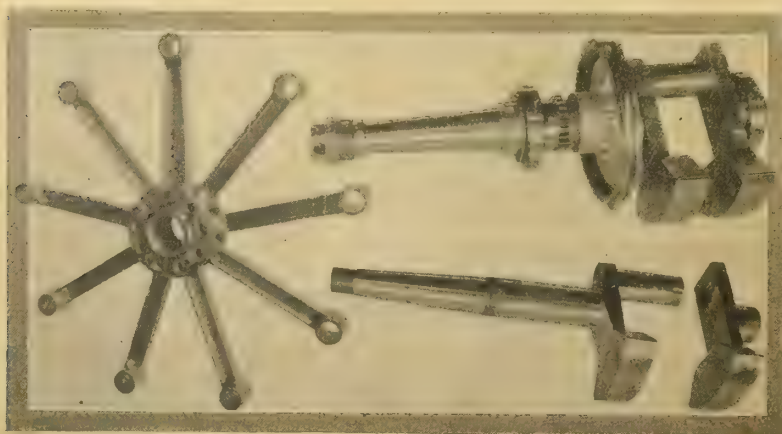
Short aluminum alloy Lynite pistons are used with ribs in the head running in both directions. They have four  $\frac{1}{8}$ " Perfect Circle compression rings and one  $\frac{1}{8}$ " oil ring. The piston pins are full floating bearing directly on the aluminum alloy of the piston head while operating in the bronze bushing on the connecting rod.

The single piece master rod is of the big end type spun with babbitt to provide a bearing for the crank pin. The eight articulated to the master rod by wrist pins which are bronze bushed, oil being carried to all bearings under pressure.

The crankshaft is of the single throw counterbalanced split type design to permit assembly with the master rod. It is hollow throughout its length and is used to distribute oil to all parts of the engine. The front or load end, which includes the crank pin, is mounted on two SRB ball bearings, the forward one taking the thrust as well as the radial load. The propeller shaft is integral with this end of the crank. This shaft tapers and is fitted with a keyway, locating the hub which is standard equipment. The crank pin telescopes into the rear section and is carried completely through it. The two sections are united by a bolt and two pins. The crankshaft is supported in the rear by another SRB ball bearing.

The main crankcase is a one piece aluminum alloy casting. Bolted to the front of this crankcase is a section that contains valve tappet guides, front main bearings and cams. A double track cam is driven from a spur gear on the front crankshaft. The cam rings

*(Continued on next page)*



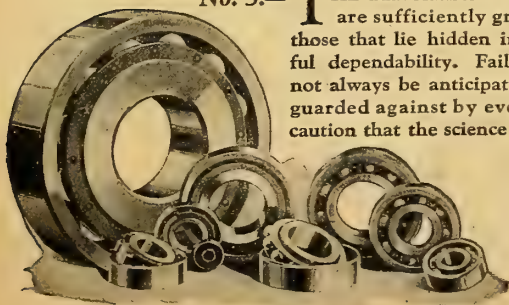
Details of connecting rods and crankshaft, Velie L-9 engine



## Plain Talks on Fine Bearings

No. 5.—**T**HE unavoidable hazards airmen must face are sufficiently great, without adding those that lie hidden in bearings of doubtful dependability. Failure, though it need not always be anticipated, should always be guarded against by every mechanical precaution that the science of aviation knows.

The dependability of NORMA-HOFFMANN Precision Bearings is a known and tested quality—not alone in the world of aviation but, as well, in the industrial, mechanical and automotive worlds. And everywhere it is identified with constructions of outstanding excellence and with records of dependable performance.



### NORMA-HOFFMANN BEARINGS CORPORATION

Stamford — Connecticut

PRECISION BALL, ROLLER AND THRUST BEARINGS



(Continued from preceding page)

are one piece steel forgings with internal gears and are assembled on an aluminum alloy hub. The cam rings each run at  $\frac{1}{4}$  engine speed and each has four lobes.

All accessory drives are grouped at the rear of the engine and are readily accessible. The oil pumps include a double scavenger pump and one pressure pump. The pressure pump forces oil directly through the hollow crankshaft to all working parts. The sump is located in the inlet manifold and consists of a jacket surrounding the intake manifold passages, which, in addition to draining the oil, also serves as a heater for the incoming

fuel mixture. The oil collecting in the sump is drawn up by a scavenging pump and delivered to the external oil tank, while the second scavenging pump delivers to the oil tank any surplus oil from the accessory drives and the discharge from the pressure relief valve.

Ignition is furnished by two Scintilla AG9D magnetos mounted on rear of engine. The triple carburetor is the Stromberg NAT4, which operates as three separate carburetors, throttle and mixture control being operated from pilot's cockpit. Provision is made at the rear of the engine for mounting of Eclipse starters.

tubing. The motor mount is integral with the fuselage skeleton and is also welded steel. Engine section cowling is of aluminum and fitted with large inspection doors.

The landing gear is of the split type, each side being independent of the other, thus providing an especially wide tread of six feet. All landing gear struts are of streamline tubing. Oversize wheels, 26 by 4 inches, are used as a safety factor for landing in soft fields. The tail skid is made of steel spring leaves, mounted on a swivel, making the ship more maneuverable on the ground.

The wing is of the full cantilever, monoplane type which has been successfully used on large multi-motored passenger planes. The construction of the wing is of wood, the ribs being basswood while the spars, which are 12 inches deep, are of spruce. The leading and trailing edges are of aluminum. All tail surfaces on the Kari-Keen coupe are built up of welded steel tubing.

The entire plane with the exception of the engine section is covered with the highest grade government specification Flight-tex fabric, which is given six coats of Dupont pigmented, nitrate dope.

Dual controls of the standard stick and pedal type are fitted. One set of controls is removable when not in use for instruction purposes, while the pilot's controls are permanent and actuate all the control surfaces by positive push rods, eliminating all cables and pulleys.

Following are brief specifications:

Wing spread .....	30 feet
Length overall .....	22 feet
Height overall .....	6½ feet
Weight, empty .....	650 pounds
Weight, full load .....	1,130 pounds
Capacity or useful load .....	485 pounds
Maximum speed .....	110 miles an hour
Cruising speed .....	90 miles an hour
Minimum speed .....	38 miles an hour
Maximum climb .....	1,040 feet a minute
Ceiling .....	20,000 feet
Gasoline capacity .....	30 gallons
Cruising range (6 hours) .....	550 miles
Gasoline consumption .....	5 gallons per hour
Oil consumption .....	1 pint per hour
Oil capacity .....	3½ gallons



## KARI-KEEN COUPE

**T**HE new Kari-Keen coupe is a two-place, side-by-side closed cabin monoplane of the full cantilever type, developed by the Kari-Keen Aircraft, Incorporated, of Sioux City, Iowa. It is especially designed for the business man and sportsman who would utilize small fields where quick take-offs and slow landings are essential.

This ship is powered with a Velie M 5 five cylinder radial air-cooled engine developing 62 horsepower at 2,000 revolutions a minute.

This plane is ideally adapted to the private owner, because of ease of operation and low maintenance with all the comforts of the inclosed car.

The cabin has been specially designed to equal in comfort and convenience a fine automobile. Comfort is assured by generous seat space, ample leg room and deep, soft cushions. The upholstery in the cabin is a rich, artis-

tically patterned mohair. Door handles, window lifts and control sticks are fully nicked and the instruments are conveniently grouped on an instrument panel.

Every precaution has been taken to make the cabin wind and weather tight and as near soundproof as possible so the passengers may enjoy their flights under any weather conditions without requiring special clothing. A specially designed door and windows with narrow pillars provide exceptional vision in all directions for both pilot and passenger.

The two-place seat, which is 40 inches wide, provides ample shoulder room for pilot and passenger. This feature is especially desirable when the coupe is used for instruction purposes. Just back of the seat is a baggage compartment with ample capacity for two suit cases and small parcels.

The fuselage skeleton is of welded steel



Views of the Kari-Keen full cantilever monoplane powered with a 5-cylinder Velie engine

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GREAT LAKES AIRCRAFT CORPORATION, CLEVELAND, OHIO





## GOLDEN EAGLE C-5

**T**HE Golden Eagle monoplane was designed by Mark M. Campbell, designing engineer for the R. O. Bone Company of Inglewood, Calif. The Velie M-5, 60 horsepower radial engine is standard, but other engines of about the same weight can be installed, for the engine mount is detachable. The ship has a safety factor of plus 8.

The Golden Eagle has a split axle landing gear with a 6-foot 9-inch tread and 26x4 Goodyear tires. The fuselage and engine mount are made of seamless steel tubing of a modified Warren truss welded in steel jigs.

Tail surfaces are steel tubing welded in steel jigs. Elevators are operated by a push and pull tube, 1 inch in diameter, and the rudder is operated by one-eighth inch Roebling steel control cable. The rudder has three hinges working around the main rudder beam, which is 1 inch in diameter. Elevators are made in one assembly, with 6 fittings made similar to the rudder fittings. Tail assembly is braced by a steel tube from the bottom longeron and with wires of one-eighth inch diameter on the rear beam of the stabilizer to stern post and vertical fin. Stabilizer is adjustable on the ground, but since the variable load is on the center of pressure, no adjustment is needed except to take care of differences of pilots' weights.

The wing is fastened to the fuselage by four center section struts and four diagonal struts, which are attached 9 feet 3 inches from the center on each side. These diagonal struts are one and one-fourth inches by 16 gauge, and are streamlined with wood, covered with cloth, and doped and painted to match the cowling and landing gear. Struts are held in place by three-eighth inch nickel steel bolts and have adjustable ends to facilitate alignment. Center section struts have five-sixteenths nickel steel bolts, and drag is taken care of by two steel struts from engine mount.

Wing construction is of clear grain laminated spruce. I-beams are used with filler blocks at points of fitting attachments. The beams are of 4-piece laminated construction assuring straight grain spruce. Ribs are built up of one-fourth by one-fourth spruce, gusseted with Haskelite and secured with casein glue and nails.

There are 8 compression struts in the wing, nearly all of them being of double construction. All wing fittings follow over the beam, thus reducing size of bolts needed to hold fittings in place. All fittings are held in place by three-sixteenths of an inch or one-fourth inch nickel steel bolts. The leading edge of the wing is covered by plywood. Ailerons are set in wing panels one foot from each end, and are built up of wood with aluminum trailing edge.

The entire ship is covered with Flightex and doped. Wings are finished in silver or gold, and fuselage and tail are finished in any color desired. The cockpits are upholstered in black, and Consolidated instrument panel is standard.

The Velie M-5 engine was described in

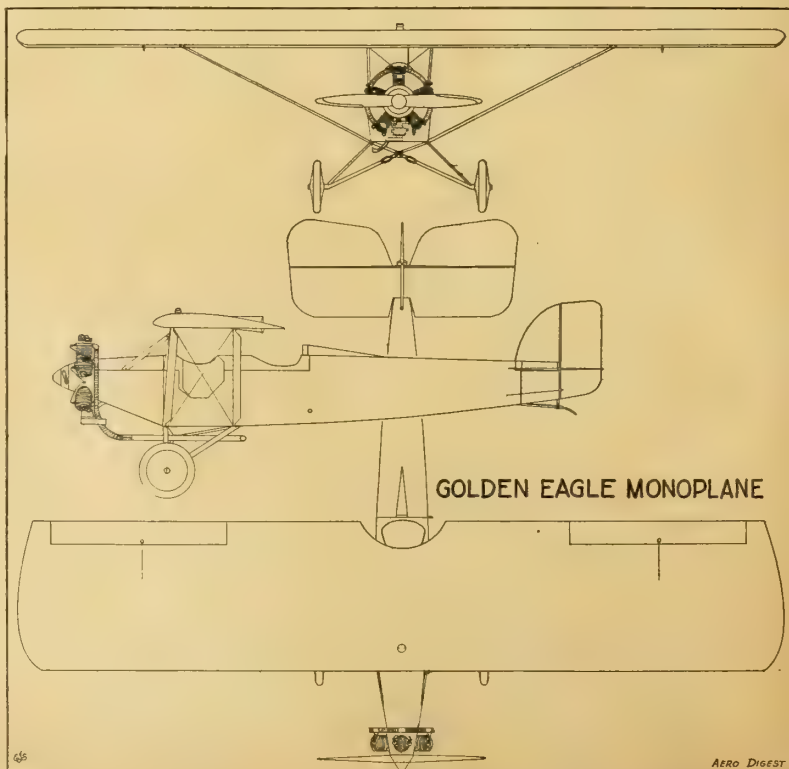
the May, 1928, issue of AERO DIGEST. It has a bore of  $4\frac{1}{8}$  inches and a stroke of  $3\frac{3}{4}$  inches. The motor is equipped to take standard mounting of Eclipse electric starter. Two Scintilla magnetos are standard equipment.

### Specifications

Length overall	21 feet
Height overall	7 feet
Airfoil section	Clark Y
Span	30 feet 6 inches
Chord	5 feet
Wing area	150 square feet
Aileron area	14 square feet
Stabilizer area	16 square feet
Elevator area	11 square feet
Fin area	3 square feet
Rudder area	6 square feet
Weight empty	750 pounds
Load (pilot, passenger and fuel)	500 pounds
Gross weight loaded	1250 pounds
High speed	90 miles per hour
Cruising speed	75 miles per hour
Landing speed	30 miles per hour
Climb at sea level (full load)	400 feet per minute
Service ceiling	8000 feet
Range at cruising speed	$3\frac{1}{2}$ hours

### BERLINER MONOPLANE

**I**N the December issue of AERO DIGEST a description of the Berliner monoplane appeared. Two typographical errors occurred—one in reference to the construction (on page 1164), which should have read "monocoque" and not monocoque and the other in regard to performance, where the absolute ceiling is listed as 1,600 feet; this should have read 16,000 feet.



Scale outline drawings of the Velie-engined Golden Eagle monoplane

# On the Stubble Fields of the Nation

## Goodrich has helped write the History of Flying

TWENTY-FIVE YEARS AGO, on the sandy slopes of Kill Devil Hill, two brothers wrote the first proof that man could ride the winds in a device that was heavier than air. Three years later, on the stubble fields of Western Ohio, they wrote history again... this time the first chapter of a chronicle that has not yet reached its climax.

Flimsy things of canvas and spruce, these first planes slid to earth on skids rather than wheels. When wheels were added, they were bicycle wheels with bicycle tires....

But soon after, even before the airplane had struggled out of its first crude form, Goodrich made its first real

airplane tire. And ever since—over the battlefields of France, through night and fog with the Air Mail, over sea and land with Lindbergh, Kingsford-Smith, Byrd—Goodrich has

gone where aviation has gone... progressing as flying has progressed... adding its share to the effort of those thousands who are so intent on complete victory in man's battle for wings.

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The earliest airplanes slid to earth in almost any stubble field they could find....

Today's ships alight on fields as carefully tended as a putting green, with Goodrich tires to help cushion the shock.



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# Goodrich Rubber for Airplanes



# FAIRCHILD 21 MONOPLANE

**T**HE new Fairchild 21, a two-place low wing semi-cantilever monoplane of simple construction, has been designed specifically for the instruction of student fliers. The two cockpits in tandem are easily accessible, and the design allows excellent range of vision from both. The cockpits are so situated that the airplane can be flown solo from either cockpit without the use of ballast. The dual controls located in each cockpit include rudder pedals, brake pedals, control sticks, throttle, mixture control, ignition switch and gasoline shut-off control.

Wings are of conventional construction with box spars and spruce ribs. The bearing surfaces of all drag bracing fittings on the wing are exceptionally large to eliminate the possibility of the drag bracing's becoming loose or being pulled into the wood.

Ailerons are balanced to compensate for yaw. The action of the ailerons is differential, the up movement being 30 degrees and the down movement 10 degrees. This arrangement makes it possible to maintain lateral control below stalling speed.

The fuselage is constructed entirely of welded chrome-molybdenum tubing, reinforced at the joints.

Tail surfaces are constructed of built-up Alclad channels riveted together and covered with cloth, forming a stiff light structure. Elevators and rudder are unbalanced and are jugged for interchangeability.



The stabilizer is anchored rigidly to the fuselage in any one of the three positions. The fin and stabilizer can therefore be anchored rigidly to the fuselage with streamline wires, preventing tail flutter.

The landing gear is of the split axle type, having the unusually wide tread of 8 feet. The shock absorbers are of the oil and spring type, having a total travel of 10½ inches. Brakes of simple and positive action are standard equipment on the Fairchild 21. They are unusual in a plane of this type.

The landing angle is 11 degrees, while the stalling angle of the wing is 18 degrees. There is no tendency in a high landing for the nose of the airplane to whip down, the usual result of stalling. There being no recoiling to the landing gear, the rebound is eliminated in a high rough landing. On

the other hand, if a student tends to make a landing below the ground, as is often the case, the easy action of the oleo struts changes the angle of attack on the wing so slowly there is no tendency to bounce.

A tail wheel which replaces the conventional tail skid is carried in a fork which is free to travel the full 360 degrees. The tail wheel fork is, in turn, carried in the frame which is pivoted to the fuselage and is free to move upwards and backwards under the shock of landings. The entire unit, except for the wheel, is housed inside the fuselage where it can be inspected or removed quickly as a unit. The tail wheel tire is 14x3, which is the new commercial size now available. The total travel of the rear wheel on the oil and spring shock absorber is 8 inches, in addition to the cushion effect obtained from the tire in operation.

Included as standard equipment are the following Pioneer instruments: air speed indicator, altimeter, tachometer, oil pressure gauge, oil temperature gauge. All instruments are located in the student's cockpit. Instruments in the front cockpit are optional.

The Genet engine installed in the Fairchild 21 is a five-cylinder air-cooled, radial type. A Hamilton wooden propeller was selected as standard equipment.

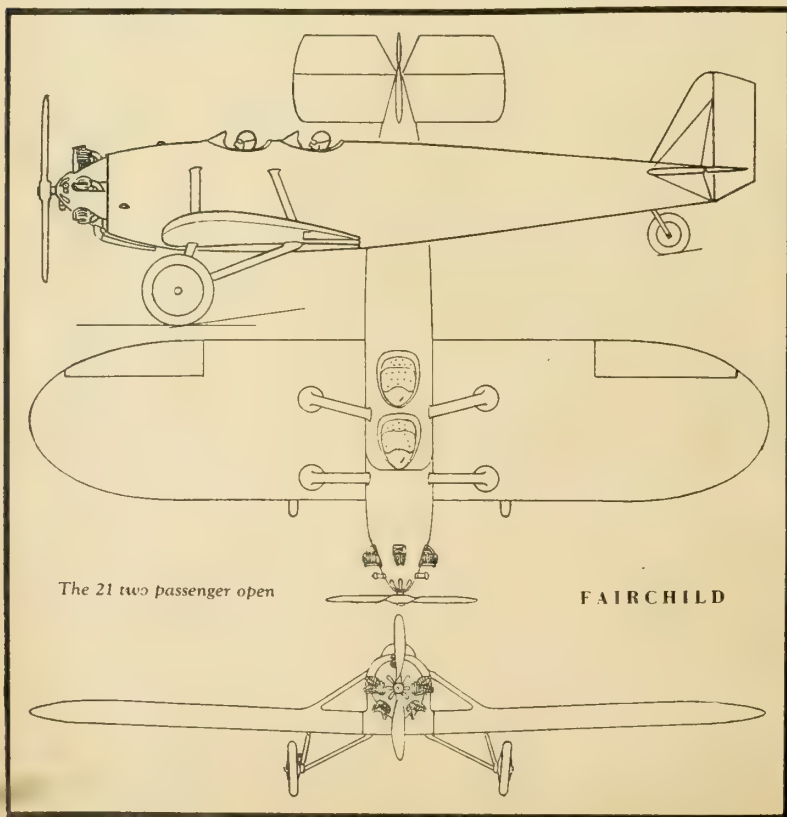
The cowl is neat and convenient. The magneto cover in front of the engine is made up as a unit which may be removed in a few seconds, thereby completely exposing both of the magnetos. The oil tank can be removed without disturbing the rest of the installation. The treatment of the exhaust manifold is novel in that it does not project outside of the cowl surface, but is carried in a deep recess. This results in excellent streamline.

The gasoline is carried in one 20-gallon tank located in the fuselage, and it feeds by gravity to the carburetor. The gasoline line is so attached in the gasoline tank that no gasoline can be trapped in the tanks.

The outside of the Fairchild 21 is finished in three colors, in any one of the stock combinations or to the customer's specifications. The finish is Berryloid and consists of nine coats sprayed on and sanded under carefully controlled conditions—temperature control, humidity control and exhaust fans to insure an excellent finish on all airplanes.

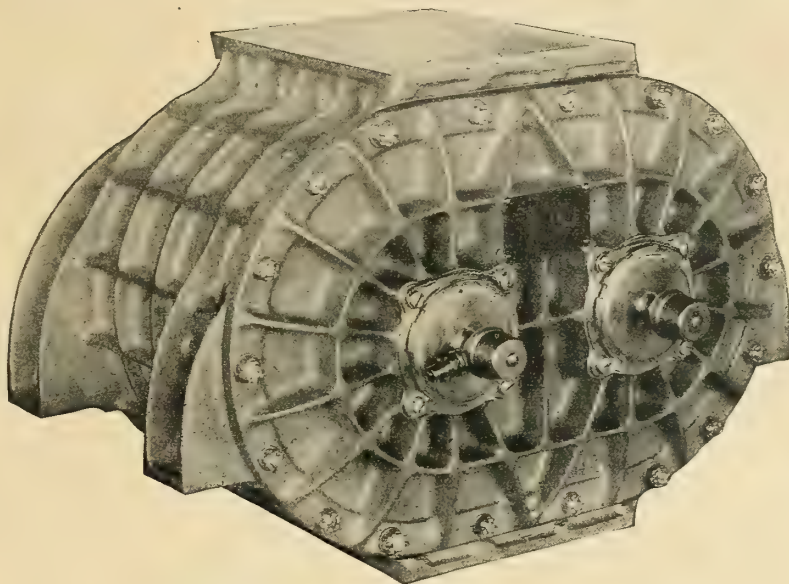
The extensive use of cadmium plating to preventing corrosion, the annealing of all.

(Continued on next page)



Outlines of the Genet-engined Fairchild semi-cantilever monoplane.

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The impellers in this supercharger are 9½" in diameter with an 8" face. The entire unit is used to supercharge engines of 235 to 500 H. P. **SKF** Ball Bearings insure smooth and easy running . . . reducing friction to a minimum. Continuous speeds up to 6,000 R.P.M. are maintained without appreciable effect on the bearings. **SKF** Bearings never require adjustments therefore . . . initial tolerances remain unchanged.

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You men who plan, build, use or pay for machines of any kind, remember this: It costs more to replace a poor bearing than to buy the best one that **SKF** ever produced. AND **SKF** ANTI-FRICTION BEARINGS ARE THE HIGHEST PRICED IN THE WORLD.





(Continued from preceding page)

copper gasoline and oil lines, oiling of the inside of the fuselage to protect the inner wall of the tube are special features of this Fairchild plane.

#### General Dimensions

Span ..... 28 feet 3 inches  
Length ..... 21 feet 6 inches

Airfoil ..... Gottingen 387  
Wing area ..... 139 square feet  
Aileron area ..... 18.68 square feet  
Elevator area ..... 9 square feet  
Rudder area ..... 4.5 square feet  
Stabilizer area ..... 13 square feet  
Gasoline capacity ..... 20 gallons  
Gross weight ..... 1,250 pounds  
Weight empty ..... 755 pounds

Disposable load ..... 495 pounds

#### Performance

High speed ..... 105 miles per hour  
Landing speed ..... 40 miles per hour  
Initial climb ..... 700 feet per minute  
Cruising speed ..... 90 miles per hour  
Cruising range ..... 425 miles  
Service ceiling ..... 9,400 feet

## FAIRCHILD 41 MONOPLANE

THE new Fairchild 41 cabin monoplane is designed to accommodate a pilot and three passengers. It is a high wing monoplane of the braced type, having an unusually wide wheel tread, and folding wings. This combination is obtained by the use of triangular wing stubs rigidly attached to the top of the fuselage. These wing stubs contain the gasoline tanks and are braced to the bottom of the fuselage by a streamline strut. The landing gear shock-absorbing strut attaches to the outer apex of the triangle. The wings themselves, which fold backwards from the rear spar, are braced by a single broad strut from the bottom of the fuselage, and when extended, lock securely to the front of the triangular wing stubs.

The outer panels of the wing are of orthodox wood construction, covered with cloth. The spars each consist of two solid planks of spruce laminated together, and form a solid beam 6 inches deep and 1½ inches thick. The ribs are of spruce with plywood gussets. The spars are inter-con-



nected by heavy wood compression ribs and double wiring, so that they are very rigid in torsion. The leading edge is reinforced by extra ribs, and is covered with thin sheet duralumin.

The ailerons extend from the rear spar to the trailing edge, along the outer two-thirds of the span. The inner third of the trailing edge is made as a flap, hinged to the top of the rear spar. This flap is swung upwards, and permits the wing to fold snugly

against the side of the fuselage. The framework of both flap and aileron is made of Alcad and is covered with cloth.

The wing struts are of clean design. Instead of running two independent struts to brace the front and rear spars, two struts are placed within a single covering and form virtually a single strut. This "single strut" attaches to the fuselage directly below the rear spar, at which point it is about 3 inches wide. At the point of attachment to the wings, the strut is some 18 inches wide. It is anchored to the wing between the two spars by means of a heavy duralumin cross-truss, to which it is attached with a screw adjustment. The two members which compose the strut are duralumin channels 3 inches deep, braced to each other by a continuous lattice work. The whole is covered with cloth in a streamline contour.

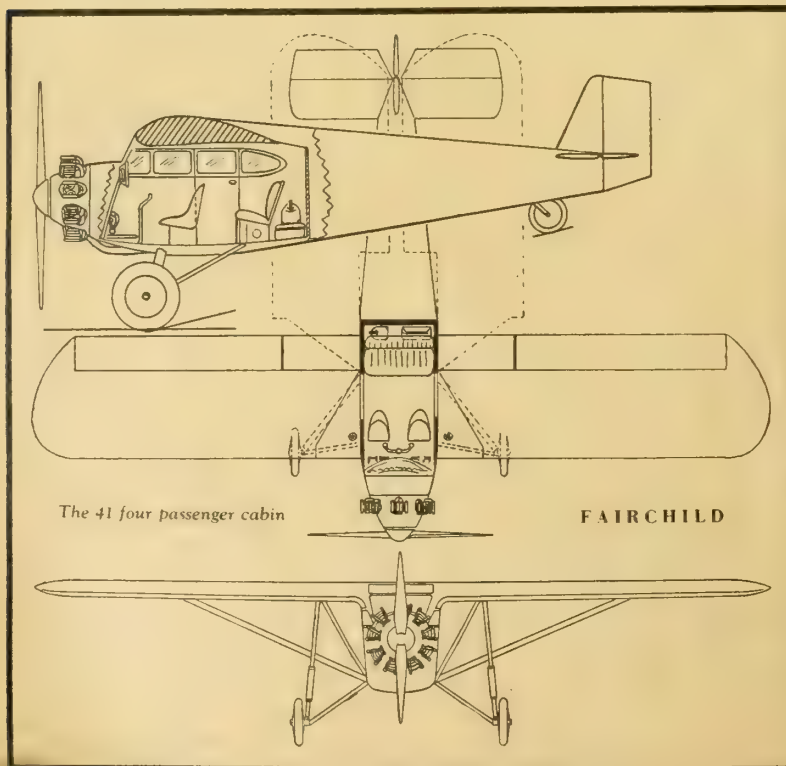
The wings can be folded by one man alone. When extended they are held in position by a hinge pin which it is impossible to release unintentionally. No tools are required to fold the wings. With the wings folded, the width of the plane is 12 ft. 5 in.

Because the gasoline tanks are not carried in the folding portion of the wings as in earlier Fairchild models, but are carried in the rigid triangular wing stubs, the action of the folding wings is very light, and there is no tendency of the wings to distort while in the folded position. Also, the weight of the gasoline remains virtually over the wheels, and thereby makes it much easier to raise the tail of the fuselage.

The landing gear is of the split axle type, having a tread of 10 feet. The shock-absorbers are of the oil and spring type, having a total travel of 10 inches.

On the "41" a tail wheel replaces the conventional tail skid. The tail wheel is carried in a fork which is free to swivel a full 360 degrees. The swiveling is restrained by rubber shock-absorber cord of

(Continued on next page)



Outline drawings of the new Fairchild 41 cabin monoplane.

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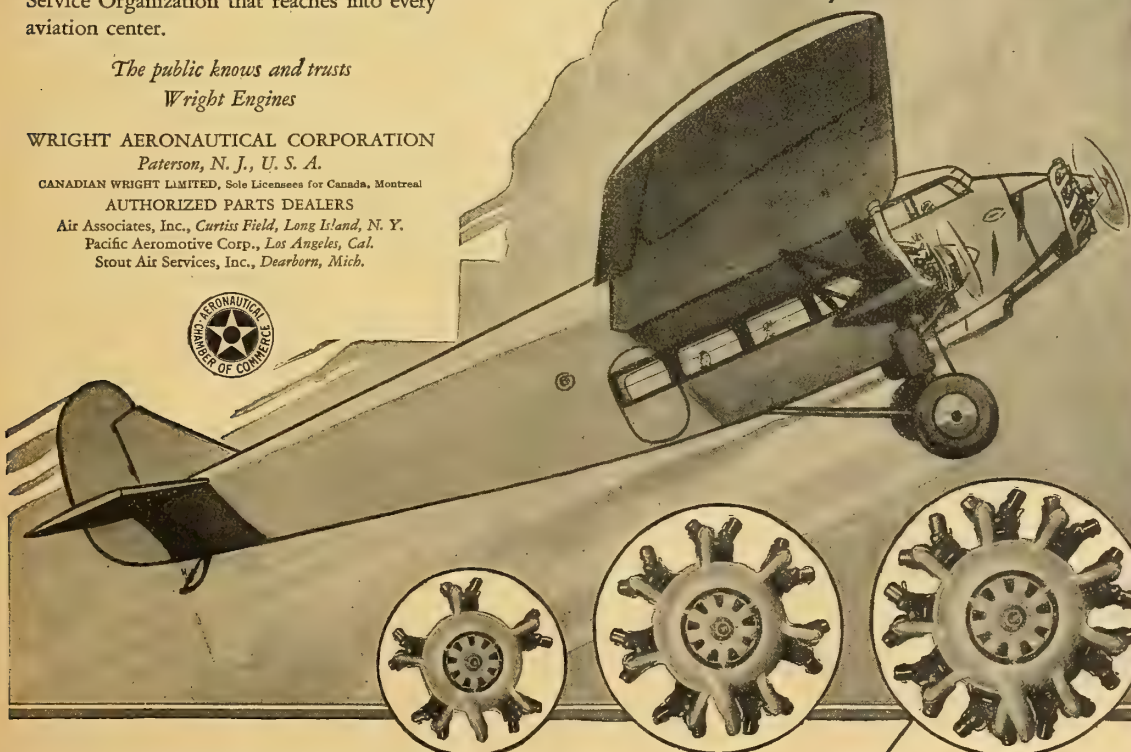
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NOR WILL ANY AGE FORGET  
THE FIRST FRAIL CRAFT  
WHICH BLAZED THE TRAIL  
OF MAN'S CONQUEST OF  
THE UPPER BLUE!



# WRIGHT

*The* **FIRST**  
**NAME** *in* **FLYING**



(Continued from preceding page)

sufficient strength to prevent oscillation of the wheel in taxiing, but flexible enough to allow the wheel to deflect when striking ruts or when turning. The tail-wheel fork is in turn carried in a frame which is pivoted to the fuselage and is free to move upwards and backwards under the shock of landing. The shock absorption is by means of rubber cords.

The "41" is designed for the installation of floats, which fasten to the fuselage and the wing stub on the same fittings as the conventional landing gear, and which can be installed in about three hours' time. For use in winter where deep snow or frozen lakes are encountered, the landing wheels may be replaced with skis, which fasten directly on the axle.

Bendix disc wheels and brakes are standard equipment, the brakes being individually operated by the pilot's foot pedals. Tires are 30 by 5.

The tail surfaces are all constructed of duralumin channel, covered with cloth. The elevators and rudders are unbalanced. The front edge of the fin is adjustable on the ground, and can be so set as to carry the machine on a straight course without the use of the rudder. The fin does not telescope into the tail-post, but bolts on top of it. This means that the fin cannot rust tight in the fuselage.

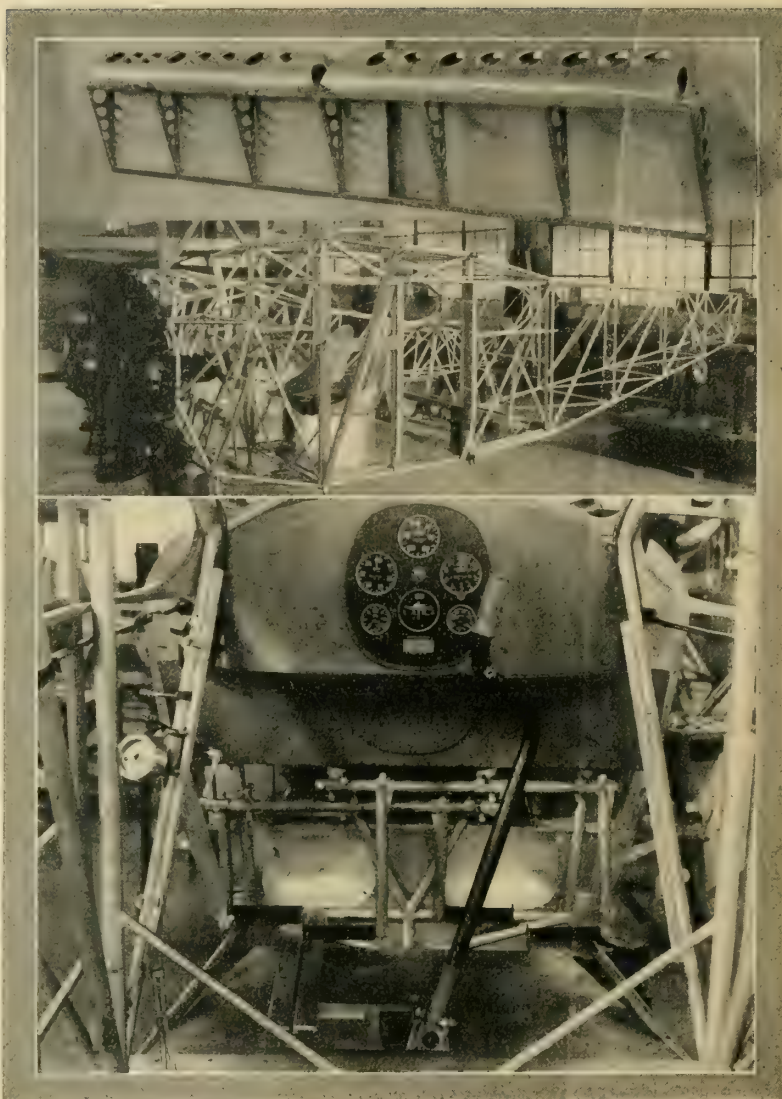
The stabilizer is anchored rigidly to the fuselage in any one of three positions, and the usual screw adjustment is operated on the elevator instead of the stabilizer when in flight. This means that the fin and stabilizer can be anchored rigidly to the fuselage with streamline wires, and prevents tail flutter.

The fuselage is constructed entirely of welded chrome-molybdenum steel tubing, reinforced at the joints with chrome-molybdenum steel plate. All the important fittings are made of alloy steel forgings, and are bolted in place with taper bolts. These forgings are accurately located in a master jig, making possible the interchange of wings and landing gear with any fuselage.

The two fittings on either side of the bottom of the fuselage which take the pull of the wing struts are connected together by a steel tie rod which passes through the fuselage tube and has a tensile strength of 12 tons.

The fuselage skeleton is covered with wood framing to give it streamline contour, which is in turn covered with cloth and doped. The windows and doors are made part of this framing. The engine mount is an integral part of the fuselage. The flooring, controls, seats, and other units are made up as separate assemblies and bolted in place. The fuselage cross-tube directly back of the instrument board is made of special non-magnetic steel, so as not to affect the compass.

There are no exposed wires or levers in the cabin. Dual flying controls are standard equipment. Dual throttle and brakes are extras, since they are not necessary except for school machines. The control stick (which is of duralumin, so as not to affect the compass) is placed between the two



Construction details of the Fairchild 41. Top view shows the balanced aileron, the center view the fuselage skeleton and below it the instrument board, foot pedals and control arrangement.

front seats, and somewhat forward of them with an extension which makes it possible for either man to fly the plane. Brakes are fitted at the pilot's seat (left side) only, and are operated by the pilot's heels.

At the pilot's left and within comfortable reach is a crank operating the elevator adjustment. The crank serves the same purpose as the conventional stabilizer hand-wheel. The adjustment is made by an irreversible screw thread, which locks the crank in any position, and permits more accurate adjustment.

There is no "stabilizer adjustment" in the strict sense of the word. The machine is balanced by a screw adjustment operating on the elevator, which applies a load by means of steel coil springs to the elevator cross-shaft, and so takes the load off the control stick. It accomplishes the same purpose as the usual stabilizer adjustment, and affects the pilot's control in exactly the same way.

The rudder cables run directly from the

foot pedals to the rudder horn, passing under the cabin floor, and are fitted with fiber guides where required. The aileron control is operated by a torque-tube from the base of the control stick to back under the cabin floor opposite to where the wing struts attach. Cables take off from the torque-tube at this point and run directly up the struts to the wing, where there is a bell-crank and push rod to the ailerons.

The elevators are operated by push rods from a cross-shaft inside the fuselage. The elevator cables and the stabilizer adjustment springs also attach to this shaft. The brakes are operated by tension-cables running on bakelite pulleys.

The instrument board consists of a small metal panel, finished in crackle lacquer to match the upholstery, and is mounted in the center of the front cowl. The following Pioneer instruments are standard equipment: compass, air speed indicator, altimeter,

(Continued on next page)



A WACO-10 with OX5 motor of the type used by Ed Hedeem in his world's record flight.



*Ed Hedeem* says of his record-breaking WACO: "The ship showed no signs of strain. It stood the test remarkably well. It was just as staunch and tight on the last roll as on the take-off."

## WACO sets a *New World's Record!*

### Ed Hedeem in a WACO Plane Makes 283 Barrel Rolls

**A** GAIN WACO speaks for itself . . . with the authoritative voice of performance.

Flying a WACO with OX5 motor, Ed Hedeem set a new world's record November 11th. He made 283 consecutive barrel rolls at Air City Airport, Wisconsin . . . exceeding the former record by 203 rolls!

And yet, after this record flight, official inspection

revealed that no adjustments whatever were necessary.

His WACO was a regular stock model with more than 330 hours to its credit. Of this time, some 250 were student training hours in which the plane was rolled more than a thousand times, not to mention hundreds of loops and spins.

Once more it is proven by performance that WACO planes, built for commercial and pleasure flying, are unsurpassed in safety, strength, and all-round utility.

THE ADVANCE AIRCRAFT COMPANY · TROY, OHIO

Write for catalog AD19. Reasonably prompt deliveries with OX5, Siemens-Halske, Hispano-Suiza, or "Whirlwind" motors, type certificates 9, 13, 26, 41, 42.





(Continued from preceding page)

tachometer, oil thermometer, oil pressure gauge. All the instruments are of the new small dial type and are flush-mounted, including the compass.

The Wright Whirlwind engine powers the 41 and a Hamilton wood propeller, with spinner, is standard equipment. An Eclipse hand-inertia starter is also standard equipment, together with a primer and a carburetor heater.

The magneto cover in front of the engine is made up as a unit, which may be removed in a few seconds, thereby completely exposing both of the magnetos. The oil tank is removable through the top cowl without disturbing the rest of the installation. The side cowls are hinged and may be readily opened for inspection and adjustment.

The exhaust manifold does not project outside of the cowl surface, but is carried in a deep recess. This results in excellent streamlining. An effective exhaust silencer has been incorporated in the tail pipe.

A gasoline line is attached to both the front and the rear of each tank, so that no gasoline can be trapped in the tanks. A selective valve on the fire-wall allows fuel to be drawn from either tank. From the

valve it passes through a strainer and water trap on its way to the carburetor.

One fuel gauge is fitted to each tank, and is located inside the cabin above the window. Each gauge consists simply of a bakelite tube, containing a colored cork ball floating on the surface of the gasoline.

The cabin is entered through an adequate door on either side. The interior upholstery is in two-tone leather and broadcloth. Back of the upholstery is a thick layer of kapok sound-proofing. The trim is grained walnut, and the appointments are complete.

The rear seat is continuous across the back of the cabin. It is equipped with deep Marshall spring cushions, and upholstered in leather. Back of the seat is space for four suitcases. Under the seat is a locker for tools, starter crank, etc. The individual front seats are of metal and are also fitted with Marshall spring cushions, and have storage space underneath. The pilot's seat is adjustable fore and aft. The front passenger's seat may be reversed, so the passenger faces aft.

The windshield and forward windows are of non-shatterable glass. The window beside the pilot's seat is fitted with an automobile type regulator by which it may be lowered.

The doors are strong, and fitted with triple locks. A ventilator and a floor heater are standard equipment. The floor is covered with a carpet, similar to an automobile sedan. Safety belts are provided for all seats, in material to match the upholstery. The interior is spacious and comfortable.

#### Specifications

Span .....	36 feet
Length .....	25 feet
Height .....	8 feet
Wing section .....	Göttingen 387
Area of wing .....	200 square feet
Area of elevator .....	11.6 square feet
Area of stabilizer .....	16.7 square feet
Area of fin .....	4 square feet
Area of rudder .....	7.2 square feet
Weight, empty .....	1,780 pounds
Disposable load .....	1,220 pounds
Gross weight .....	3,000 pounds
Gasoline capacity .....	50 gallons

#### Performance

High Speed .....	130 miles per hour
Landing Speed .....	49 miles per hour
Cruising (1650 r.p.m.) .....	108 miles per hour
Service Ceiling .....	12,400 feet
Initial Climb .....	720 feet per minute
Climb in 10 minutes .....	5,350 feet
Cruising Range .....	500 miles

## A CATERPILLAR LANDING GEAR FOR AIRPLANES

By Paul E. Lamarche, Jr.

THE Louis Vinay Establishment of Paris has developed a new form of landing gear which is called the "patin atterrisseur" (literally the "runner landing gear"), the invention of Monsieur Chevreau. It is an ingenious caterpillar tread device which has been tried out with success and proved to have many advantages. This landing gear can replace the usual wheels on any landing gear immediately, since they fit on the same axle and are secured in much the same manner. Mounted on ball bearings, the case of the roll over the ground is sufficient to permit a natural and easy take-off for an airplane. The caterpillar tread is attached to the landing gear axle in such a way that it allows the plane to pivot on its axis when it meets an obstacle such as bumpy ground, holes, ruts and small streams. It can overcome obstacles on the ground up to a height of about 16 inches with ease.

When the airplane equipped with this new device passes over a hole or a small ditch this landing gear, which measures about five feet in length, forms a bridge and enables the plane to cross without falling in. On ploughed fields the landing gear rolls over the tufts of ground without entering the furrows and on soft ground does not sink in owing to the naturally inclined plane which frees it from the mud automatically.

In flight, its position is parallel to the chord of the wing and is built in such a form that it diminishes the head resistance to a notable proportion. The construction is entirely of duralumin and has been carefully

studied out so as to give the required strength with the least weight, which does not exceed on standard types of aircraft the weight of ordinary wheels. The treads are made of rubber. A shock absorbing device placed between the plates inside gives an added elasticity to the entire plane when it makes contact with the ground.

With this new form of landing gear another problem is also solved, that of the braking of airplanes. By being able to use brakes on this form of gear, there is no necessity for blocks under the wheels when tuning up the engine. Likewise the plane

thus equipped possesses the ability of landing in small fields and in the case of a forced landing a pilot alone can start the engine without the plane moving forward.

Westinghouse air brakes are mounted on each caterpillar tread inside the plates that form the sides and where they offer the least resistance. They are controlled by a handle in the cockpit and worked by compression by the intermediary of the carburetor which gives an easy progressive braking. If the engine should stop, a vacuum chamber will permit the application of the brakes.

Trials were conducted with excellent results on this device at the Evreux Air Field and later at Le Bourget before an official commission. The pilot, M. Peillot, stated that he found it easier to maneuver his plane on the ground than with wheels. Its use seems well adaptable to amphibian planes.



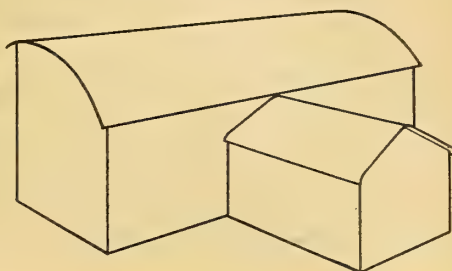
The Vinay-Chevreau caterpillar landing gear for airplanes.



# BUTLER

READY-MADE

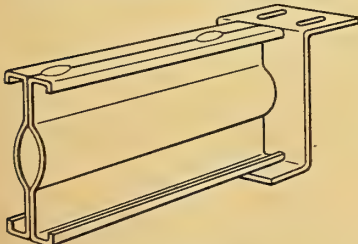
# HANGARS



## PRIVATE QUARTERS READY MADE FOR YOUR PLANE



In all Butler Ready Made buildings, the galvanized steel wall and roof sections are stiffened with deeply drawn corrugations on 8-inch centers, giving a neat paneled effect.



In Butler Ready Made industrial buildings the structural purlins are a combination of tubular and I-beam design, giving the maximum strength attainable.

REGARDLESS of how much you fly, the greater part of your ship's life is spent in port. Always the landing field is comparatively isolated from your range of landlubbering activities.

A Butler Hangar, Ready Made for your plane, affords protection against the elements, against fire and against tampering. Roll back the steel doors—there's your ship just as you left it. Getting out is a matter of moments. Figuratively

speaking, she's always headed into the wind.

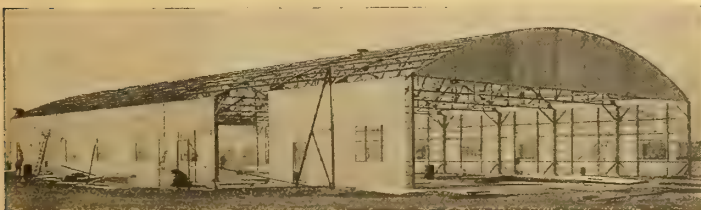
Permanency is one of the outstanding characteristics of Butler Ready Made Hangars, yet they may be taken down unit by unit and moved to a new location without damage or loss of anything more than a few dropped bolts or taps.

Butler Ready Made Hangars range from the smallest individual sizes to the enormous airport sizes which are familiar landmarks at many landing fields.

Book 102 will supply you with the additional information you need. Let us send it to you.

**BUTLER MANUFACTURING COMPANY**

13th and Eastern Ave.  
Kansas City, Missouri



Butler Ready Made Steel Hangar, size 80 by 150 feet, at Fairfax Field, Kansas City, photographed while in the course of erection.





## Install the "Challenger" Engine in *Your Ship*—

### *It Gives You:*



Travel Air; 3-place Open Cockpit Plane with Curtiss "Challenger" installed.



Robin; 3-place Cabin Monoplane with Curtiss "Challenger" installed.



Fledgling; Open Cockpit Training Type with Curtiss "Challenger" installed.



Fairchild; 5-place Cabin Monoplane with Curtiss "Challenger" installed.

**Smoothness:** The "Challenger's" unique arrangement of six cylinders on a two-throw crankshaft provides more perfect dynamic balance than is obtainable with any single row radial type of engine. For this reason the "Challenger" is exceptionally smooth in operation.

**Reliability:** One, two, three 50-hour runs on the block, plus hundreds of hours of flight-testing in the air—have established the unfailing reliability of the "Challenger" engine, a fact attested every day by "Challengers" in actual service.

**Economy:** Casey Jones on a recent 6000-mile transcontinental flight with a Curtiss "Challenger" averaged 11½ miles to the gallon of gas, without any expense for replacement or repairs.

### *And—*

#### *Curtiss Engineering Cooperation*

With every "Challenger" goes the assistance of the Curtiss Engineering staff in designing your installation so that the "Challenger" may bring to *your ship* 100% of its known smoothness, reliability and economy.

The "Challenger" is the product of the same engineers who have produced engines for the U. S. Army & Navy planes with noteworthy success. Now the "Challenger" affords the same kind of performance in commercial use.

Eight representative manufacturers have already purchased "Challengers" for immediate installation in their aircraft. If you want a "Challenger" for the coming season, better place your order now.

## CURTISS FLYING SERVICE

INCORPORATED

GARDEN CITY, LONG ISLAND, NEW YORK

*Sole Sales Agents in United States*

Manufactured by Curtiss Aeroplane and Motor Co., Inc., Garden City, N. Y. Factories: Garden City and Buffalo, N. Y.



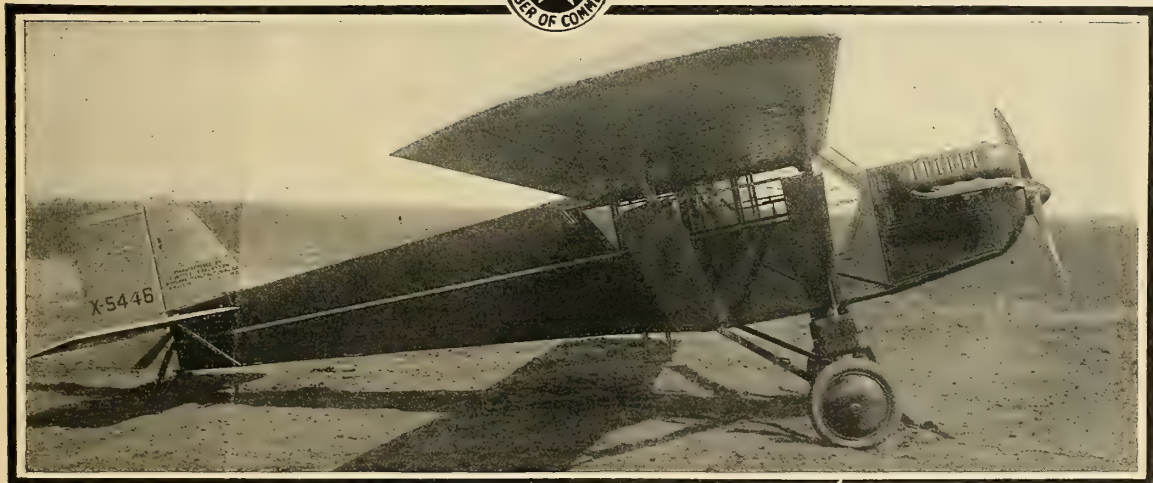
# Effortless Stability

Picture a ship that practically flies itself . . . that holds a straight true course without right rudder . . . that responds immediately to the slightest touch of the controls but is neither tricky nor too sensitive. That is what you will discover when you first take the stick of a Curtiss-Robin—for the Robin is a product of thorough design, advanced engineering and careful production in which stability, balance, and controllability have been accurately determined.

An inspection, or better still a demonstration flight, will convince you that the Curtiss-Robin has unusual stability, safety and durability—three vital factors which are making it one of the most popular planes for flying service operators, schools and private owners.

We shall be glad to send you complete information and the name of the nearest Curtiss-Robin dealer. Shall we?

Today's Biggest Value in  
Cabin Planes—The Robin



*Curtiss*  *Robin*

CURTISS FLYING SERVICE  
INCORPORATED

GARDEN CITY, LONG ISLAND, N. Y.

*And their distributors: Sole Sales Agents in the United States.*

Manufactured by CURTISS-ROBERTSON AIRPLANE MFG. CO., Anglum, St. Louis County, Missouri



# WESTERN NEWS

## HONOLULU AIR NEWS

By VERNE HINKLEY

PLANS of army officers for an expenditure of \$2,067,000 in the enlargement and improvement of Wheeler Field, Schofield Barracks, have been announced. Work on the new project, for which funds are available, is to be started June 1, 1929. Three years will be required to complete the scheme.

Under the plan, which has the approval of officers of the Hawaiian department but which also must be passed at Washington, additions will be made to Wheeler Field as follows:

Barracks for 800 enlisted men, \$504,000; barracks for 96 non-commissioned officers, \$300,000; quarters for 70 commissioned officers, \$666,000; nine new hangars, \$240,000; a new field warehouse, \$45,000; airplane field shops, \$81,000; a new air corps headquarters building, \$40,000; photo, radio, parachute and armament building, \$61,000; gasoline and oil storage plant, \$15,000; paint and dope warehouse, \$5,000; improvements to the landing field proper, \$111,000.

When the new field is completed, it is expected that the personnel will be increased to 110 officers and 1,300 enlisted men. Such an organization would be composed of two additional pursuit squadrons, a wing headquarters, a service squadron and headquarters, and another squadron which would either be pursuit or a composite group. The field is now staffed with one under-strength pursuit outfit.

The new plans will make available a runway at least 6,000 feet in length, as compared with the 2,800 feet now available. Need for such facilities was brought home forcefully earlier in the year with the arrival of Captain Charles Kingsford-Smith and his mates in the *Southern Cross*, en route from Oakland to Australia. These Pacific-spanners were unable to take their ship off Wheeler Field with a full load of fuel and were required to hop over to Kauai, the northwest island of the group, where a special runway had been prepared at the Barking Sands along the southern seacoast.

The new field also will be a vast improvement insofar as living quarters for commissioned and enlisted personnel is concerned. The latter now live in the vast caverns of unused hangars, sleeping in rows of cots set up in the dim interiors. Every bunk has a mosquito net, the winged pests being highly in evidence at Wheeler. Officers who are not able to obtain quarters in Schofield Barracks two miles away are forced to rent homes in Honolulu, distant by 25 miles.

AN indication of the activity in aviation in Hawaii is contained in the announcement that the territorial aeronautical commission will ask \$467,290 from the 1929 territorial legislature for the furthering of its

scheme of inter-island airways. How much of this amount will be granted is, of course, problematical. The legislature of 1927 gave \$135,000, of which \$100,000 was spent in the acquisition of landing fields on four islands, —Kauai, Oahu, Molokai and Maui. An additional \$25,000 was spent on the improvement of the airport in the Waiakea district, just outside of the City of Hilo on the island of Hawaii.

With the new appropriation, the commission expects to erect administration, storage and service buildings, hangars and machine shops and establish a meteorological service. Plans are also being drawn for the lighting of airports, for the assembly of radio equipment and for the construction of pilot quarters, seaplane runways and stages.

Another plan calls for the enlargement of the existing field at Port Allen, Kauai, adjoining the army field there. The commission is still without a definite plan for Maui.

THE Hawaiian Aeronautical School has been opened here by Alfred H. Shuttlewood, formerly of Stow Field. A course in the designing and building of motors is to be given. Students will be prepared for Department of Commerce examinations.

EXPECTING to inaugurate within the next two months an air service to Maui, Hawaii, and possibly Kauai, using Oahu as a base, E. H. Lewis has brought to Honolulu three planes,—an American Eagle, a Swallow and a Monocoupe. A fourth ship, a trimotor Bach cabin job, has been ordered for early delivery.

James L. Giffin and George A. Anderson, pilots, have come to Honolulu with Lewis to operate his ships. A flying school also will be established, in which they will be instructors.

A NEW emergency landing field which may be used by planes flying between Oahu and Molokai, first island to the southeast, has been found near Koko Head by Charles Dolan, Jr., and Charles Stoffer. It is probable that the aeronautical commission will obtain permission from the owners for the use of the area, which has a width of 200 feet and a length of 1800.



The Russell parachute fully opened

## CALIFORNIA AIR NEWS

Douglas Company Expands

THE Douglas Company of Santa Monica has been reorganized and refinanced as the Douglas Aircraft Company, Inc. Heretofore the company has confined its production to government airplanes, but under the new arrangement, a commercial line of planes will be added.

The personnel of the organization remains substantially as before, except that it is enlarged. Donald W. Douglas is president of the company. The names of several prominent Eastern and Pacific Coast bankers have been added to the board of directors. The directors are: C. M. Keys, Latham R. Reed, J. C. Cowdin, W. E. Douglas, John J. Mitchell, Jr., W. D. Longyear, Alphonzo E. Bell, H. W. Elliott, Ray Robinson, M. B. Rapp, Thomas B. Eastland, H. H. Wetzel and H. Grube.

L. A. Municipal Airport Dedicated

IN commemoration of the first power-driven flight of man, the new Los Angeles Municipal Airport was formally dedicated Sunday, December 16, twenty-five years after the first flight of the Wright brothers at Kitty Hawk, N. C., December 17, 1903. As the words of a bronze plaque reveal, the airport was dedicated "in honor of the pioneer aviators who have given their all that the science of aviation could be perfected, enabling it to take its place in the world's commerce, this airport is dedicated. December 17, 1928, on the 25th anniversary of the first flight of man."

During the morning, visiting officials, pilots, etc., were entertained and conducted around the new airport. The afternoon program, to which the public was admitted, began at 2 o'clock.

The first race was a six-lap OX-5 race with six entries, won by Ray Solomon in his Waco; 2nd place, Charles Dycer in his Lincoln Page; 3rd, Eddie Angel in his American Eagle; 4th, Al Hobart in an American Eagle.

The dead-stick landing contest had eight entries and was won by Lee Brusse in the Kinner-motored Crown, landing 9 feet from the line; 2nd place was taken by the Monocoupe from the Pomona Airport.

The high-powered engine race, six laps, had six entries and was won by Bob Blair in a Buhl Airedan; 2nd, Clarence Gunther in his Stearman; 3rd by L. Miles in his Waco.

THE Aero Maintenance and Supply Co. of San Francisco specializes in service for aircraft. A complete cleaning service on a weekly basis is offered. The company also does mechanical servicing. Gerard E. McGavran, who was chief mechanic for the *Southern Cross* previous to its trans-Pacific flight, is associated with the company.

(Continued on next page)



SEASON'S GREETINGS!

PROSPEROUS PAYLOADS

HAPPY LANDINGS

BACH AIRCRAFT COMPANY  
Clover Field Santa Monica  
California



*(California Air News Continued)***Los Angeles Terminal Airport**

A NEW airport, which will cost about \$1,000,000, is being built in Los Angeles. This new Grand Central Air Terminal is being backed by C. C. Spicer, J. L. Maddux and associates. When completed, this project will embody many of the finest facilities in air terminal development. The central administration building and depot, measuring 200 x 100 feet, will include a loading platform, a covered walk leading to planes, three zones for the segregation of passengers and baggage, dining facilities, etc. The other principal buildings are to be used by the Maddux Air Lines. Bids for the construction of the large Maddux hangar, 400 x 130 feet, have been opened. The Maddux offices will occupy a 200 x 40 foot building and shops will be located in another of equivalent size.

Two runways, approximately 2,500 feet in length, and a taxiway, 150 feet wide, will be of concrete. The remainder of the field will be sanded and oiled to prevent dusting.

The airport is located between Griffith Park and Glendale.

**Maddux Air Lines Schedules**

THE Maddux Air Lines, operating passenger and express airlines from San Francisco through Los Angeles and San Diego to Mexico, revised its schedules and rates on November 15th. Planes now leave Los Angeles at 8:00 a.m. and arrive in San Francisco at 12:30 p.m. The return trip is the same. Southbound planes leave Los Angeles at 10:00 a.m., leave San Diego at 11:20 a.m., and arrive at Agua Caliente, Mexico, at 11:40 a.m. The return plane leaves at 3:00 p.m., arriving in Los Angeles at 4:45 p.m. Planes westbound for Calexico, Mexicali, leave Los Angeles at 9:00 a.m., arriving at Calexico at 11:30 a.m. The return is made at 2:00 p.m., arriving in Los Angeles at 4:35 p.m.

**Aero Corporation of California Expands**

ABSORBING the Standard Airlines, Inc., and the Master Aircraft Company, the Aero Corporation of California, Inc., is undertaking a program of expansion. The new corporation will operate flying fields, schools and transport lines. Flying activities of the company will be centered at the present Master Aircraft field and ground work and servicing will take place at the adjoining Aero Corporation field. A new administration building is now being constructed, and a hangar with a capacity of thirty-two planes will be erected soon. The tri-weekly airline from Los Angeles to Phoenix and Tucson will be extended and made into a daily service.

Officers of Aero Corporation are: Jack Frye, president; Paul E. Richter, Jr., vice president and treasurer; Walter A. Hamilton, vice president in charge of operations; E. R. Chisholm, secretary; and Nathan Newby, Jr., legal advisor.

BY recent contract with the War Department, the Russell Parachute Company of San Diego will make 1000 thirty-

foot anti-aircraft sleeve targets for the Army Air Corps. The manufacture of these targets will require about 60,600 yards of cloth and 72,000 feet of manila rope.

THE San Diego Air Service Corporation, operating a training school on the city's municipal airport, Lindbergh Field, has adopted a new policy by which it is compulsory for students and pilots to wear parachutes during training flights. The Russell lobe parachute will be used. This is one of the first schools in the country to adopt such a policy.

**New Feature at Western College**

A NEW feature of practical training inaugurated for students at the Western College of Aeronautics is the repairing of privately owned ships. At present sixteen different jobs are under the process of reconstruction by members of the building and designing classes, according to Carl S. Clark, secretary of the board of managers and business manager of the college.

Sixteen students who have completed the course at Western College of Aeronautics are now employed by that organization. The first four students graduated are now employed in the airplane division of the Ford Motor Company. Seventeen new students were enrolled in Western College during the month of November.

DURING the past six months, the Mutual Aircraft Corporation has carried, on its midnight express line between Los Angeles and San Francisco, a total of more than 54 tons of freight and express. The company's planes have flown approximately 48,000 miles on this night service, without a single forced landing because of mechanical difficulties.

EDDIE MERRITT, former Stinson test pilot, is now manager of the Tanner Air Livery of Los Angeles. Charles Towns and R. C. Williams, who were also formerly with Stinson, have joined the staff too. The company is erecting a hangar at Clover Field, where it has established headquarters. Stinson planes are distributed in Southern California and Arizona by the company.

LEE SCHOENHAIR and John Guglielmetti remained aloft in the Albatross monoplane for 42 hours 59 minutes in an attempted endurance record-breaking flight from Helm Airport, Fresno, Cal. They took off at 8:41 a.m., November 26, and landed at 1:40 a.m., November 27. They carried 646 gallons of gasoline and 40 gallons of oil, the gross weight of the plane being 7,650 pounds.

THREE evening courses in aviation are being conducted at University College, evening branch of the University of Southern California, during the 1928-1929 winter quarter. The course in aeronautical engineering is in charge of Lieut. Easton B. Koger; the study of commercial aviation is under Earl W. Hill; and the classes in air law are being conducted by Rudolf Hirschberg of the University of Koenigsberg.

**San Diego Air Service Corporation's Ground School**

A GROUND school to supplement its air training was established by the San Diego Air Service Corporation on December 15. On this same date the corporation, of which I. N. Lawson, Jr., is president, and Roy Campbell, Jr., vice president, completed its faculty.

Lawson will give courses in aerodynamics and airplane design; Campbell, in air commerce regulations, airport management and business problems of aviation; W. H. Bow-lus will be superintendent of technical instruction and give courses in airplane and glider construction and maintenance, plant management and production methods; Archie Atherton will give a course in care and use of parachutes; Dean Blake, in aeronautical meteorology; Doug Kelly will give courses in operation of aircraft, navigation and principles of construction; W. H. Mackey, aircraft engine maintenance and repair.

The San Diego Air Service Corporation is the first to occupy space in San Diego's new municipal airport, Lindbergh Field, and its Travel Air planes operate from there daily.

**OAKLAND AIR NEWS**

OAKLAND Municipal Airport officials are expending approximately \$250,000 for additional flying field improvements and facilities.

The largest non-military hangar in the United States is now nearing completion at the airport. This structure, which measures 120 feet by 300 feet, will cost \$90,000. In addition to the 36,000 square feet of storage space available in this hangar, a 20-foot lean-to which runs the full length of the building provides for shops and offices.

With the completion of this hangar, 96,000 square feet of space will be available at Oakland airport for the storing of planes.

At present all of the hangars are full, and about a dozen planes are stored outside the hangars. The airport clerk's report for November 9 revealed that 82 planes were at the field. A fifth hangar, the same size as hangar No. 3, costing approximately \$75,000, will soon be built.

The dredging of a channel from the deep waters of San Leandro Bay direct to the hangars now is nearing completion. This channel will cost approximately \$100,000 and will provide for speed boat communication between the Oakland airport and San Francisco Bay cities, reducing the distance between the Oakland airport postoffice and the San Francisco ferry postoffice to 11.2 miles. It is estimated that the construction of a wharf at the end of the channel will involve the expenditure of an additional \$25,000.

The extension of the airport drainage system, now under way, is to cost approximately \$15,000 and the installation of a paved roadway, sidewalks and gutters along the north side of the field, from the highway to the channel landing, will cost close to \$50,000.

COMPARED with that of November of last year, the November operations report of the Oakland Municipal Airport  
(Continued on next page)

# LEARN TO FLY WITH RYAN

AT THE T.C. RYAN FLYING SCHOOL San Diego

## WHERE EXPERT PILOTS and EXECUTIVES of the Aviation Industry ARE TRAINED

*It means something to be a Ryan Graduate. Ryan graduates are real pilots. Real pilots are in demand.*

It is a widely recognized fact—RYAN STUDENTS ARE BETTER TRAINED! Ryan graduates, by virtue of their long, thoro training with complete equipment under competent instructors, are better qualified to fill the important flying and executive positions which are opening up on every hand.

### Winter Classes Now Enrolling

No delays, no inconveniences. Every day is a flying day in San Diego! No winter—no sleet, slush and snow—no freezing temperatures—no high winds or storms. That's why U. S. Government flying activities are centered here, and why 42 world's records in aviation have been broken here.

### NOTE:

*T. C. Ryan Flying School is under the personal supervision of T. Claude Ryan, founder of all Ryan Aviation Activities in San Diego.*

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### THIS COUPON WILL BRING YOU AN INTERESTING CATALOG

The T. C. Ryan School specializes in a complete course covering four full months—with 60 hours in the air and thoro ground training—qualifying you for a limited Commercial License.

Also a Private Operator's course, covering two months—with 20 hours in the air and primary ground training. Also *Advanced Work* for those who have had previous training.

**T. C. RYAN FLYING SCHOOL, Dept. A, 411 Union Bldg., San Diego, California**

Gentlemen: I am interested in your course of flying instruction. Please send me your catalog.

Age.....

Name ..... Address .....



*(Oakland Air News continued)*

shows that there was an increase of more than 400 per cent in student and passenger flights, that plane landings were almost tripled and that the gross revenue was increased practically tenfold.

Since January 1, 1928, 61,871 plane landings have been recorded at the airport, 38,488 passengers have been carried, 7,767 student flights have been made and the gross revenue totals \$30,794.34.

**WESTERN** Air Express, operating the "model airway" between Oakland Municipal Airport and Vail Field, Los Angeles, is engaged in extensive tests of radio communication between ground stations and planes in flight.

Ralph M. Heintz, designer of the sets used by Wilkins and Byrd in their polar explorations, as well as that on the *Southern Cross* on its Oakland-Australia flight, has outfitted the Western Air Express Fokkers.

**A** NEW instrument, known as the Levelometer, which is said to indicate instantly banking, pitching, climbing or rolling movements in airplanes, is being tested at Oakland Municipal Airport by Major Livingston Irving. The new instrument is a product of the Tri-Arc Company of Oakland.

**SEVEN-DAY** air mail service is now furnished on the Seattle-Oakland-Los Angeles route operated by Pacific Air Transport. In the past, planes have not flown the coastal route on Mondays, but increased mail

poundage has made necessary the amplification of the service.

The seven-day service also applies to the Oakland-San Jose route, 40 miles in length and rated as the shortest air mail line in the world.

**OAKLAND** Municipal Airport's own postoffice was officially opened December 1. First class mail, parcel post, mail and money orders will be handled by Chester A. Weaver, airport clerk, who has been sworn in as a postal employee.

**IDAHO AIR NEWS**

By IDA DURNIN

**THE** Boise Flying Club opened its second season of ground school activities with a smoker at the Legion club house recently.

**PLANS** are progressing rapidly toward establishing an official stop at Idaho Falls on the Great Falls-Salt Lake mail route operated by the National Parks Airway. The city officials of Idaho Falls have voted to light the airport.

**PAUL** McKINLEY, who recently graduated from the Rankin Flying School of Portland, will start a flying school and air taxi service in Twin Falls.

**LETTERS** 18 feet high on the roof of the Home Lumber Company building now mark the city of Buhl for airplanes. A luminous paint was used which makes the sign visible after dark.

**UTAH AIR NEWS**

By GLEN PERRINS

**BOEING** and Varney airlines are mapping out an extensive expansion here, according to W. E. Boeing and Walter T. Varney, presidents of the two concerns.

Operation of a day service passenger line between Portland and Salt Lake, which will save twenty-four hours to transcontinental travelers to and from the Pacific Northwest and extension to Portland of the Varney lines air mail service, which now terminates at Pasco, are projects announced by Walter T. Varney.

Preparations for an extensive passenger service and a double schedule on the Boeing company's air mail line from Chicago to Salt Lake and San Francisco, were announced by W. E. Boeing.

**A**N emergency landing field at Wells, Nevada, is ready for use, with the exception of the beacon lights, which are expected to be installed soon.

**FRANTZ** NIELSON of Salt Lake City has invented a non-sinkable mail container for use on transoceanic airplanes. The carrier is so constructed that it can be automatically released from a damaged airplane.

**CEDAR CITY AIRPORT** will soon be completed. The main runway is 3,400 feet long and 660 feet wide. A large beacon tower has been erected.

## The First Five Cylinder Radial Was Built By

# KINNER



**THE KINNER AIRPLANE & MOTOR CORPORATION** built the original popular sized radial engine. It has been the first to discover and correct minor troubles that affect new light air-cooled power plants. Kinner continues to stand two years ahead of the field.

U. S. Dept. of Commerce Approved Type Engine Cert. No. 2.

**KINNER AIRPLANE & MOTOR CORP.**

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## THE BAT IS HERE



**THE** fastest little plane in the field today. Powered with a BAT 25 H.P. three cylinder radial motor, or a Lawrance 28 H.P. opposed engine.

Fuselage of welded steel tubing and covered with THURTEX Fabric. Snappy looking red-brown fuselage and gray wings and tail surfaces.

One-place only; fly-away San Francisco ... \$1,095.

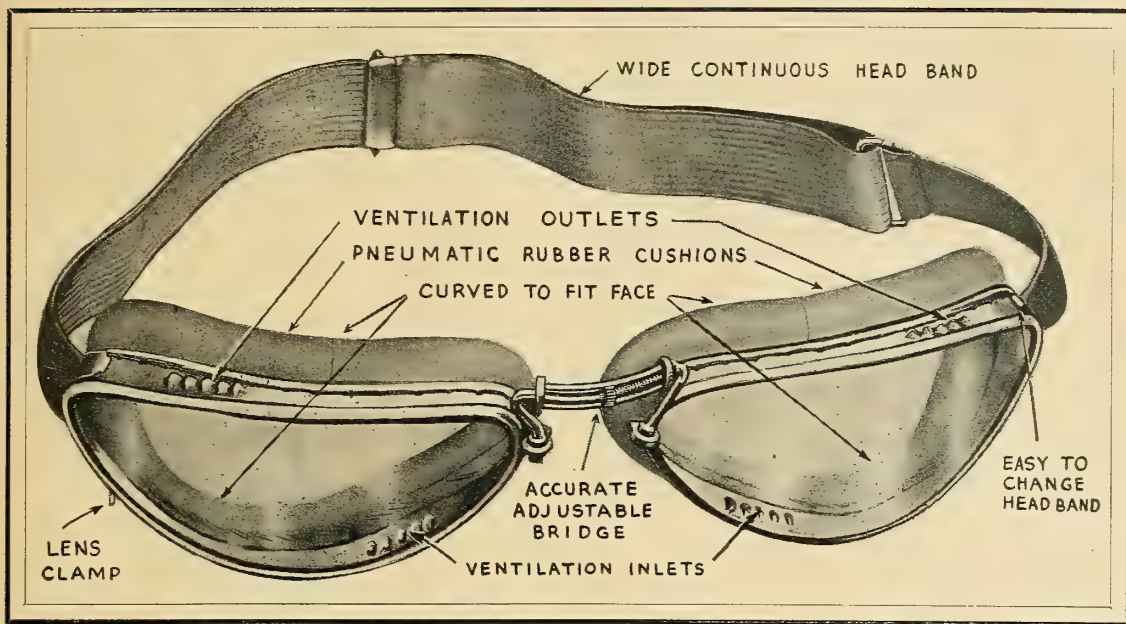
Two-place with Szekely 40 H.P. \$1,695.

Twenty Cents for Circular.

**THE NORAN AIRCRAFT CO.**

157 Tenth St. San Francisco, Calif.

# A REMARKABLE GOGGLE FOR ALL WEATHER FLYING



*The New Dictator*

**I**CY blasts of winter . . . glare of desert sun . . . rain . . . hail . . . none of these can impair the vision afforded by the new Dictator goggle, latest product of Italy's most prominent goggle manufacturer. So comfortable that the pilot forgets he's wearing them; so light that he cannot feel their weight; so durable that a single pair, barring accident, will last him practically forever.

Easily adjusted nosepiece and headband make it possible to fit the Dictator to any face. The lenses are

readily removed or replaced . . . a feature of economy; in case he breaks one or both lenses, the pilot need not buy a new pair of goggles. Dictators are fully guaranteed, are protected by world-wide patents and are far superior to some goggles selling at twice their price.

## PRICES

With plain lenses, \$6.50 pair. With colored lenses, \$1 extra. (Choice of smoked or green.) Extra plain lenses, \$2.50 pair. Extra colored lenses, \$3.50 pair.

Unusually attractive prices to aviation schools, dealers in airplanes, or dealers in aviation equipment.

*Opportunity for distributorship:* a very attractive proposition is open for exclusive distributorship of the new Dictator goggle in a few productive localities. Write without delay for prices, discounts and other information.

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EXCLUSIVE IMPORTER FOR THE U. S.

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## Distributors:

East: Air Associates, Inc.

Midwest: Nicholas-Beazley Airplane Co., Inc.

West: Western Auto Supply Co.



## CONTACTS

By FRANK E. SAMUELS

**I**MPROVEMENTS of airports and flying fields in this territory are being made rapidly, and the old fields enlarged and brought up to date. Visitors at Clover Field, Santa Monica, who have not been on the field for the past three months, will be surprised at the splendid airport that the city of Santa Monica has made out of that old and well known flying field. Level as a floor and oil surfaced, a runway into the prevailing winds has been laid out long and wide enough to take off and land the largest and fastest ships. Two large fire-proof hangars are being erected on the north side of the field, and the entire plant is being put in shape for efficiency.

**T**HE new Air Terminal, formerly the old Glendale flying field, is another transformation from a dangerous short run flying field to an up to date airport. The old field and an adjacent orchard grove have been bought by private interests, the trees removed from the orchard, the runway lengthened to twice its original length, and the entire plot of land, from the Southern Pacific Railway tracks to the Los Angeles River, is now a graded oil surface. Mad-dux Air Lines are building one of the largest hangars in the West and will make the airport the headquarters of all their lines. It is perhaps the most accessible of any port in the territory, having a railroad side track and being within 15 minutes' drive of the business section of Los Angeles.

**T**HEN there is the new Aero Corporation Airport on Western Avenue. This was formerly known as the Burdett flying field, and later as the Master Aircraft field. This beautiful airport, accessible from the air from all points of the compass, will be the headquarters of the Standard Air Lines, running between Los Angeles, Phoenix and Tucson, Arizona. Contracts for a large administration building of the Spanish type of architecture and a service hangar have been awarded, and work will be commenced on these two units at once. There are very few airports to compare with this one, so favorably situated almost in the heart of a city.

**T**HE Los Angeles Metropolitan Airport is a busy place at present, and it looks as though the city of Los Angeles will make arrangements for a perpetual lease for space on the field to be used for emergency and for city aviation officials' headquarters. The field is in fine shape. Runways are so arranged that landings and take-offs may be made from any direction. Construction is going ahead rapidly on a number of buildings, most prominent of which are the large Bach Air Transport factory buildings, which will be ready for occupancy about the middle of January, and the up-to-the-minute Aircraft Service Station of the Richfield Oil Company.

**I**MPROVEMENTS are being made at the Lincoln Airways Airport, on Angeles Mesa Drive. New hangars and a new office building have been erected; every building has been newly painted; the runways have been lengthened and leveled; and a grass plot fifty feet deep, running the entire width of the airport is laid out between the boulevard and the runways.

**M**INES FIELD, Los Angeles municipal airport, has not as yet made much progress, although a few small hangars have been erected at the far end of the field. The city is expected to start improvements in the near future.

**T**HE members of the Timm Airplane Corporation feel proud, and justly so, of their new training ship. Both Otto and Wally Timm say, "although neither of us are in favor of stunting, it is a pleasure to know that for a training ship, which will have to stand the strain and abuse that students give a plane, the Collegiate has stood the most rigid tests." Jimmy Angel, chief pilot of Airflite, Inc., put the ship through its paces, and as a result, an order was placed for four of the ships for the training school of Airflite, Inc. Frank Clarke and Charles La Jotte also stunted the ship and were favorably impressed with its performance.

**A**SSOCIATED AIRCRAFT, INC., is branching out and has leased 1600 square feet additional school and laboratory space. The building is being equipped with all standard engines and two American Eagle

airplanes for instruction purposes. The Rankin System of flying instruction is being taught.

**T**HE Douglas Company, between keeping up with its government plane building schedule, experimental work on its new commercial planes, and, without interfering with its regular routine, moving its complete equipment to the new fireproof plant at Clover Field, Santa Monica, is finding the days too short for comfort. About one half of the working force is at the old plant, using the machinery not already moved, and the other half is at the new plant, where assembling and finishing work is being done. The new plant is the last word in airplane construction plants.

**S.** E. PAYSON, of El Centro, the largest operator of aircraft in the Imperial Valley, has placed an order with the Associated Aircraft, Inc., for twelve American Eagles with delivery to start January 1. Mr. Payson, operating under the name of the Payson Flying Service, will also conduct the Rankin System of flying instruction. Classes will be held in El Centro, Calexico, Brawley, Holtville and Imperial.

**T**HE California Aircraft Operators Association is no longer an experiment but a functioning body which is performing wonderful work. The regular meetings are always well attended, and new members are joining at every meeting. Local and state aviation officials are recognizing the value of the association's suggestions, and are consulting with the officials of the association on legislative measures.

**W**ALLACE BEERY, of Famous Lasky Players, Hollywood, recently took delivery at Wichita of his new Wasp-engined Travel Air cabin monoplane.

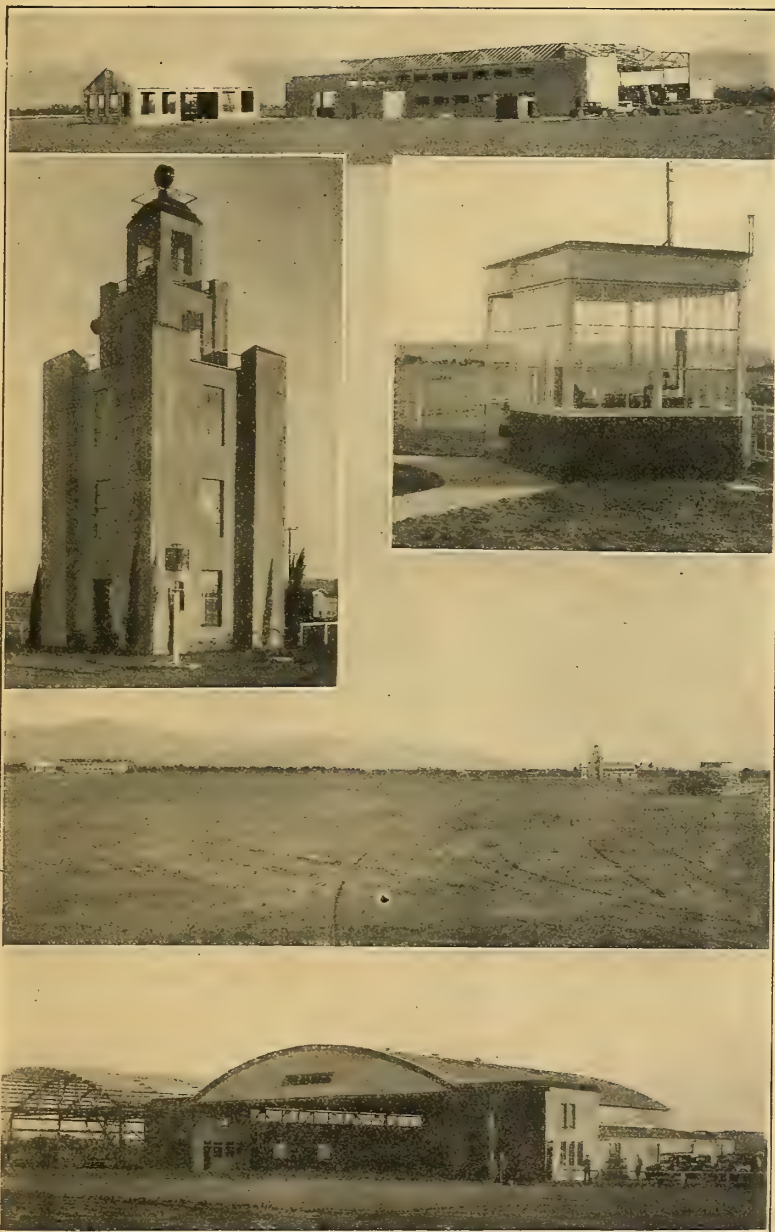
Mr. Beery's plane is the standard type 6000 Travel Air with the following exceptions: it has approximately 60 more square feet of wing; it has a gasoline capacity of about 50 gallons more than the standard job; the two rear seats have been removed and a luxurious couch put in its place. Cabin furnishings are in taupe velour upholstery. The rear compartment affords complete bathroom facilities except the bath-tub.

(Continued on next page)



Wallace Beery's Wasp-powered Travel Air. Beery and William R. Snook, Secy. and Supt. of Travel Air.

# LOS ANGELES METROPOLITAN AIRPORT



Two and a half months before these pictures were taken this was a bean field.

**Waldo D. Waterman, General Manager**

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Phone Van Nuys 522**



(Contacts Continued)

WHILE at the Kelly Airport in Hawthorne, we noticed an attractively painted Command-Aire, and Mr. Kelly informed us that he has taken over a distributorship for this plane and that he is more than pleased with its performance and with the manner in which the buying public is taking to it.

A NEW airplane distributing firm at Clover Field is composed of Frederick C. Porter and Charles B. Hughes, who have lately taken over the distribution of Buhl aircraft for California, Arizona and Nevada. The boys are placing territorial distributors, and since they both have more than their share of personality, they should have no trouble in securing some of the best distributors in their territory.

WE had the pleasure of seeing the first test flights of the Kreutzer trimotored cabin monoplane at Mines Field, Inglewood. A. K. Peterson has added new laurels by designing a plane which, for business executives desirous of a speedy and comfortable method of travel, will be hard to equal. On a test flight made by Lieut. Henry Ogden, the ship was in the air in exactly six seconds from the time that he gave it the gun. Lieut. Ogden was more than pleased with its take-off and landing tests.

VISITS to the plants of the Kinner Motors, Golden Eagle and Maximum Safety Airplanes and all of the flying fields show unusual activities for this season of the year. The transport lines are carrying capacity loads, and passenger flying was never better.

## ARIZONA AIR NEWS

By HAROLD G. WILSON

A THREE hundred per cent increase in air travel over the Southern airway has been recorded in the past year, according to figures available on the number of military and commercial planes registering at various fields in Arizona.

In November of 1928, there were 75 planes checked in at the two fields at Tucson, compared to 21 in the same month in 1927 and 14 in 1926. Of the 75 planes this year, 54 were commercial and 21 military, while a year ago the ratio was 4 commercial to 17 military. The 75 planes which landed at Tucson in November carried 160 pilots and passengers.

RAPID expansion throughout the Southwest is marking the development of the Scenic Airways, Inc. This company recently merged with the Interstate Airways and Grey Goose Company, both of Chicago, making a \$20,000,000 corporation.

The company's new airport at Phoenix was dedicated recently and a training school has been started there. This will be the base of the company's winter operations.

The south rim of the Grand Canyon has been the summer base of operations for the past two years. A third base, the eastern division, is being improved on land leased at

the municipal field at El Paso. Phillip Lucas is chief pilot at El Paso, with Paul Scott in charge at the Grand Canyon. La-Mar Nelson is manager of operations, and L. F. M. Wilson is traffic manager. J. Parker VanZandt, president of the company, is general manager of the company and J. E. Kintner, assistant manager.

For some time the company has been operating a taxi service and making special trips. It is now looking over the field to establish a regular line between major points of the Southwest, and possibly may connect with a regular line between Chicago and the Southwest.

THE dedication of the International Airport at Douglas has been set for February 16, 1929. Adjoining this field is the field of Agua Prieta, Sonora, Mexico, which gives it an international aspect. Officials of both nations will participate in the dedication, according to present plans.

Installation of night lighting equipment, including boundary lights and a beacon, was recently completed. Hangars and a passenger depot will soon be erected.

REORGANIZATION of the Aero Corporation of California, which operates a regular passenger line throughout Arizona, into a three million dollar corporation, has recently been effected. Jack Frye, who was president of the first Aero Corporation of California, which later merged with the Standard Air Lines, remains as president.

Upon delivery of extra equipment, already ordered, the tri-weekly service from Los Angeles to Tucson, Ariz., will be extended to El Paso, Texas, and made a daily service.

RULES and regulations of the U. S. Department of Commerce, as of June 1, 1928, now apply to all airlines in Arizona, except where they conflict with state law. This ruling was put into effect by the Corporation Commission, which now seeks to control aviation in the state. Each operating company must secure a state certificate. Such certificates will be issued only when it is shown that public convenience and necessity require the service. A clause which is causing considerable controversy requires that all airplanes carry insurance to the extent of \$5,000 on each passenger and a similar amount on the aircraft itself.

BOTH Tucson and Phoenix are being considered as transfer points on the proposed stage-air line to be established by the Pickwick Stages, Inc. The stage company is planning to launch a daily service out of Los Angeles, carrying passengers by stage to some point in Arizona during the night, transferring them in the morning to a plane which will put them in St. Louis in one day's time. From St. Louis the trip to Chicago will be completed by bus. Large buses with sleeper accommodations are being built for this service.

CONSIDERABLE expansion work is now under way on the municipal field at Tucson. The Eaglerock Air Service is planning to expand its facilities there, and

work has been started by the Standard Air Lines and Southwest Air Service. The Mayse Air Service and Scenic Airways, Inc. also have leased tracts on the large municipal field.

Tracts are leased to commercial operators at the nominal sum of \$40 per year, to encourage development of aviation. The former municipal field is leased entirely to the Mayse Air School. The others have tracts on the new field, which is 1,280 acres in extent.

## COLORADO AIR NEWS

By R. C. CLEMINSON

THE Public Service Company of Colorado has installed a rotating beacon on the tower of the Daniels and Fishers store at Denver.

ALTON (TOOTS) HOGUE is building a ship of his own design. It is styled after a German pursuit ship and will be powered with a Hisso engine.

THE Denver Air Service Club has commenced activities. The club has a Hess Bluebird for instruction purposes.

WORK will soon be completed on Denver's new municipal airport which will be a first class, fully lighted airport.

DEDICATION of the airport at Alamosa was held recently.

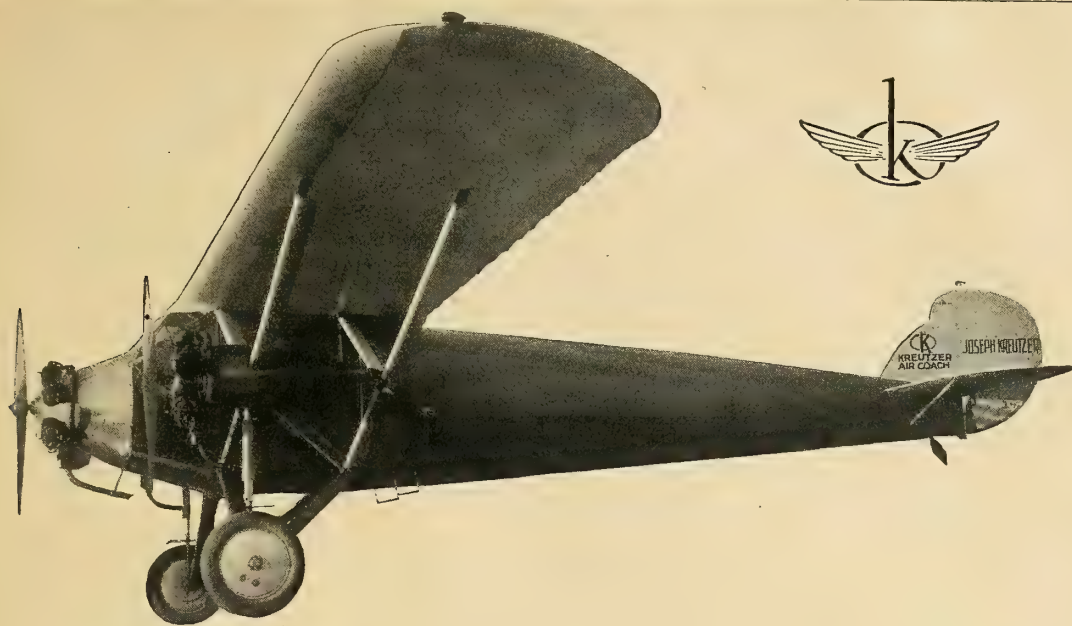
TROWEL POST NO. 160, American Legion, Chicago, purchased the Hisso Eaglerock which the Alexander Aircraft Company exhibited at the Chicago show. This plane was given away to the holder of the lucky ticket at the Legion benefit dance.

## MONTANA AIR NEWS

By C. T. SULLIVAN

GREAT FALLS has purchased 640 acres of land from the state for an airport, paying \$19,000 for it. The airport is three miles from the heart of the city. At the present time the city council is working on plans for the improvement of the field. This makes the second airport for Great Falls, the Vance field with three-mile-long leveled runways and a modern brick and cement hangar being considered one of the best fields in the Northwest. At the present time the National Parks Airways are housing their planes in the Vance hangar.

THE new Butte airport, deeded to the city by John D. Ryan, has been dedicated. Mr. Ryan constructed the field and purchased the 600 acres of land at an estimated cost of \$24,000. At the dedication ceremonies were Gov. J. E. Erickson, Senator B. K. Wheeler and Al Frank, president of National Parks Airways. The field has four decomposed granite runways. Mr. Ryan, who is a Montana capitalist, was in charge of aviation during part of the war.



## WRITE FOR THE KREUTZER FRANCHISE

Dealers are being appointed now for this phenomenal ship, the last word in aeronautical achievement. Its operating cost is less than that of many single motored ships which have no greater lift. Its first cost is less than that of most single motored ships of equal pay load capacity. Its performance in its tests far exceeded the fondest hopes of its designers and builders. It is the unusual ship . . . built to unusual specifications . . . and it is backed by an organization of unusual ability and a very liberal policy of dealer cooperation.

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**K R E U T Z E R   A I R   C O A C H**  
**TRI-MOTOR   FIVE PLACE   DUAL CONTROL   CABIN**

**JOSEPH KREUTZER**  
**C O R P O R A T I O N**  
**655 Chamber of Comm. Bldg., Los Angeles**



## WASHINGTON AIR NEWS

By C. M. LITTELJOHN

**JAMES D. GIVNAN**, of the engineering staff of the Boeing Airplane Company, in charge of the patent department, has recently invented a luminous propeller for airplanes, that is expected to aid night flying. A circle of light that outshines the dark and the fog is created by the whirling propeller treated with a new luminous liquid.

**THE** Western Aero-Auto Company, Inc., was recently formed at Seattle, with a capital of \$90,000. Incorporators are Jean De Breaux, O. S. Strausburg, F. C. Marolf, Nora Gainer, R. E. Gainer, and L. W. Thomas.

**THE** Palouse Aviation Company, with capital stock of \$50,000, has been formed at Pullman, Wash., by Henry Wittorf, Jr., W. H. Holling, and W. D. Robbe.

The aviation committee of the chamber of commerce of Pullman are seeking a site for an airport.

**OLYMPIA**, state capital of Washington, is planning to issue \$35,000 worth of bonds for the acquisition, development and maintenance of a municipal flying field.

**PUGET SOUND AIRWAYS, INC.**, was recently incorporated at Seattle. M. M. Pixley and Margaret Paronto were the incorporators of this concern.

**COLFAX** recently dedicated its airport with an air circus. Tex Rankin won the bombing contest against Major C. J.

Haynes of the 41st division air service, national guard, in the Colfax Aviation Company's Eaglerock. In his Waco plane, Rankin also won the OX-5 15-mile race over Daniels in a Curtiss Robin plane. Five army planes, from Felts Field, Spokane, commanded by Major Haynes, thrilled the three thousand spectators with stunts and formation flying.

**CAPITALIZED** at \$49,000, the Consolidated Airways has been incorporated at Seattle. Incorporators of this new enterprise are Oliver E. Hanson, Carroll D. Carter, Frederick T. Hawkesworth.

**A** SCHOOL of aviation is planned for the University of Washington at Seattle. A program is being outlined to be presented to the meeting of the Washington legislature at Olympia. An appropriation of \$48,000 for equipment is proposed, so that \$290,000 may be made available from the Guggenheim Foundation for an aviation building.

**FLYING** clubs throughout the state of Washington are being organized by Capt. John J. Bouey, formerly of the Royal Naval Air Force, who is distributor for the Driggs Dart II. Capt. Bouey has already organized West Coast Flying Clubs (groups of twenty men) in the cities of Anacortes, Puyallup, and Elma, and is organizing four such clubs in Seattle, as well as at Olympia and Shelton.

**THE** Government will provide a two-million candlepower air beacon for Longview Airport, if the field, now privately

leased to the Longview Aircraft Company, is converted into a municipal airport.

## OREGON AIR NEWS

By HARRY STEINFELD

**THE** Pacific Air Transport company inaugurated its seven-day-weekly mail service December 3.

**JAMES I. JORDAN**, former Portland newspaper man, has been appointed sales manager of the Rankin School of Flying. Lieut. Leo Allen, recently of the 91st Observation Squadron at Crissy Field, Cal., has joined the faculty of the Rankin school.

**THE** West Coast Air Transport Company each Sunday sends its Bach air yachts on sightseeing jaunts around Mount Hood. The trips are meeting with such popular approval from Portlanders that the reservations usually are sold out a week in advance.

**THE** Mackenzie-Morrow Aviation Company is offering a 60-hour flying course, which qualifies graduates for pilots' licenses. The first 10 hours of the course consist of the customary dual instruction. The ensuing 50 are solo hours.

**UNION** Air Lines of Portland plans to inaugurate, on May 1, an airline from Seattle to Juneau, Alaska. Sikorsky twin Wasp motored amphibians will be used on the run. The schedule provides for the trip to be made in nine hours.

(Continued on next page)



**MEYROWITZ LUXOR GOGGLE**  
U.S. Air Service Model No. 6

Send for Catalog *E. B. Meyrowitz* **\$10.75**  
INCORPORATED

Dept. A, 520 Fifth Ave., New York

**DISTINCTIVE AIRCRAFT**  
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**PACIFIC AEROMOTIVE CORPORATION**  
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—The man who will control movements of thousands of planes—sending them zooming through the heavens at appalling speed—on business of import.

We can train you for a similar position.

The future of aeronautics cannot be ascertained—even by the most vivid foresight. What were considered wildest prophecies have developed to be trifling incidents—when compared with astounding achievements of present day flying. Still in its infancy, aviation is destined to become perhaps the most vital force in world commerce.

A sparkling field of opportunities awaits you. Opportunities for executive positions from which you will inherit respect . . . wealth . . . glorious success. The future will be the fastest age the world has ever known—the flying age. Be prepared to reap financial profits, then, by studying and engaging in aeronautics today.

Western College of Aeronautics offers one of the finest, most complete—both technical and practical—air courses in the world. You are taught flying to perfection . . . but that is a mere detail. *The Western College of Aeronautics course goes further.* You are taught designing and engineering. It equips you for positions behind the scenes—positions of executive capacity.

Those who complete the Western course are not only competent to pilot ships, but also qualified to fill highly technical offices. *The engineering course is completed in two years.* New class starts

February 1, 1929. Prep work in Mathematics and Physics now available.

*Be prepared to engage in the most dynamic, fascinating industry of the age.*

UPON REQUEST WE WILL GLADLY SEND ALL INFORMATION.

Wm. J. Waterhouse, Dean

## Western College of Aeronautics

154 WEST SLAUSON AVENUE,

LOS ANGELES, CALIF.



*(Oregon Air News Continued)*

The operating subsidiary will be capitalized at \$350,000. Alaskan cannery men are active in promoting the venture. The service will be daily, with planes leaving Seattle and Juneau at the same time and stopping at Ketchikan and St. Petersburg en route.

The present schedule of Bachs operating on the West Coast Air Transport line between San Francisco, Portland and Seattle will be so revised that ships will arrive in Seattle from the south in time to transfer passengers to the Alaskan line. The West Coast company is a subsidiary of the Union Air Lines.

**OREGON AIRWAYS, INC.**, was recently organized at Corvallis for the purpose of promoting aviation in that city and at the Oregon State College. The company has the agency in Oregon for Swallow airplanes. Two Swallows and a cabin job will be purchased soon.

E. L. Getz is president of Oregon Airways; Capt. W. J. Chamberlin, chief pilot; and Paul Walters, sales manager.

**OREGON NOTES**

By C. K. LOGAN

**F**LIERS of the Pacific Coast Airway will be aided by a service of six radio broadcasting and receiving stations, two of which are to be in Oregon, one in Portland and the other in Medford. The entire coast airway from Seattle, Wash., to San Diego, Calif., is being marked with 2,000,000 candlepower beacon lights.

**A** TWO-PLACE cabin monoplane designed by Lee U. Eyerly is now under construction at the Pacific Airplane Service hangars at Salem. The fuselage is 22 feet long, and the wing spread is 34 feet. Power will be provided by a 100 h.p. 5-cylinder radial Kinner motor. Eyerly has designed the ship so that the pilot may be seated either in the cabin with the passengers or outside at the rear of the cabin. The ship will be used in student instruction and for commercial work.

**NORTHWEST AIR NEWS**

By F. K. HASKELL

**N**EW hangars have been constructed on Boeing Field, Seattle, by the West Coast Air Transport, to house the trimotored Bach planes which will be used on the daily Pacific Coast run from Seattle to San Francisco. The northbound plane will arrive in Seattle each afternoon during the winter, and leave for the south early the following morning.

**O**PERATION of a fresh sea food air delivery system from Seattle to eastern Washington, Montana and Idaho, including service to Lind, Ritzville and Odessa, has been inaugurated by Pacific Aerial Sea Food Company of Seattle. W. H. Whitaker is business manager of the new firm. The Eaglerock biplane used in making deliveries is piloted by Frank Kammer.

**D**EAN H. V. CARPENTER, of the State College at Pullman, Wash., headed some

100 students who have formed an aviation club, and who will foster a movement to develop a flying near the football stadium. They were addressed by R. W. Campbell of the Pacific Aviation Company, Eaglerock dealers, who may establish a training field here.

**NORTH DAKOTA NEWS**

By LLOYD C. TINNES

**T**HE International Airways, Inc., of Minot, has been reorganized. D. H. Bartholomew is president of the new corporation; Lieut. T. N. Strickler, vice president and general manager in charge of operations, and J. C. Blaisdell, Jr., secretary-treasurer.

Expansion of the concern's activities will include a school for pilots and mechanics which opens on January 1.

**F**ACILITIES at the Grand Forks airport have been greatly increased with the completion of a new highway leading directly past the airport entrance. A well built 12 x 18 warming house and tool shed has also been completed and will be used by Al Berglund, local pilot, in giving instruction to a class of air students here this winter.

**A** ROTATING beacon light located on the roof of the North Dakota state mill and elevator now tells night fliers that they are on the outskirts of Grand Forks. The beacon can be seen for a distance of about fifty miles and makes two revolutions a minute. An airport marker has also been painted on the roof of the mill.

**SCHOOLS ATTENTION!**

Why pay \$500 to \$1000 for Hisso engines, models A, E, or I, when the 300 h. p. will serve equally well for instruction purposes? A limited number only.

300 h. p. (used) Hisso engines, complete, crated, \$195 each.

**ANNOUNCING!**

the opening, early in January, of a branch store in Hangar No. 3, Municipal

**OAKLAND AIRPORT**

Complete Aero Supplies

**SPILLANE & CO.**

4512 So. Main St.

Phone Axridge 8981

**LOS ANGELES**

**DIXIE 800 MAGS**

We offer a limited number of good used Dixie 800 mags. Subject to prior sale, \$27.50 each.

**HOW CAN I LEARN TO FLY?**

Everything can be done in more than one way—but there is only ONE RIGHT WAY. The RIGHT WAY to learn to fly is to know first of all the Theory of Flight, Aerodynamics, Aerial Navigation and Meteorology, and many other fundamentals of Aeronautics. When you have mastered these essentials, actual flying can be learned in much less time than is otherwise necessary. If you want to learn the RIGHT WAY

**Get Started — Act Today!**

**UNIVERSAL INSTITUTE OF AERONAUTICS, Inc.**  
Dept. A16, 1770 North Vermont Ave.  
Hollywood, Calif.

**\$1 Starts You Now!**

For a limited time we will send you the first lesson of our Complete Course for only \$1. This lesson will introduce you to one of the fundamental steps in the science of Aeronautics. Get yours now!

**START THE NEW YEAR RIGHT!**

Give yourself an  
Aeronautical Course

**AVIATION NEEDS GREATER MAN POWER NOW!**  
Universal Institute of Aeronautics, Inc.,  
Dept. A16, 1770 N. Vermont Ave., Hollywood, Calif.  
Please send me the first lesson of your Complete Course  
for which I enclose \$1.  
Name \_\_\_\_\_ Address \_\_\_\_\_ City \_\_\_\_\_  
U.I.A.

# RESOLVE *During* 1929 TO *Fly Safe!*

*Provide yourself with a*  
**RUSSELL "Lobe" PARACHUTE**

*for that*  
**EXTRA factor**  
*of safety*

FOR only \$250 to \$350 you can have a 1929 Russell "Lobe" Parachute — representing the highest development in aerial life-saving equipment. In an emergency you simply pull the release ring—the parachute does the rest. No springs, no rubber bands, no pilot chute—nothing to get out of order.

*Send for descriptive folder  
and name of nearest dealer.*

**AIRFIELD MANAGERS:**

Send for our attractive "Russell Franchise" proposition.

*Mfd. by*

**RUSSELL PARACHUTE COMPANY**  
1202 Kettner Blvd San Diego, Calif.

## LAST YEAR WAS BIG— HERE'S TO A BIGGER ONE!

1929

INFORMATION compiled by the Aeronautical Chamber of Commerce showed that aircraft produced last year was valued at \$75,000,000. It is estimated that production will be doubled this year. Purchases of supplies, materials, etc. will show a corresponding increase.

A quarter of a billion is invested in airports! Air transport lines and fixed base operators have flown millions of miles.

AERO DIGEST too can boast of a record year. It's growth has paralleled the growth of the industry; 97% of advertising contracts already have been renewed for 1929 and many new names will make their appearance.

AERO DIGEST will continue to place the greatest and most penetrating aeronautical trade circulation at the service of its advertisers during 1929.

A HAPPY AND PROSPEROUS  
NEW YEAR!



**AERO DIGEST**  
THE MAGAZINE OF THE AIR





## Featuring Military Exactness

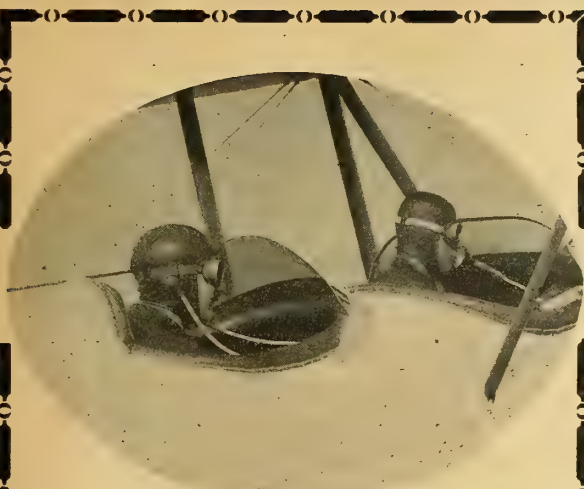


**"AIR SERVICE TRAINING"** is given by Army and Navy-Trained instructors in a fleet of Warner powered Travel Air biplanes. Graduate Pilots are assured of a skillfully deft smoothness at the controls, a comfortable feeling of self-confidence, and complete mastery of the plane begot of knowledge that comes only from the helpful instruction of friendly, competent pilots using the finest of commercial aircraft. If you are interested in these higher standards of aeronautical training, we will welcome your inquiry for further information.

**SAN DIEGO AIR SERVICE CORPORATION**

**Lindbergh Field**

**San Diego, California**



## YOUR FUTURE IN AVIATION

**Y**OUR future depends upon the primary training and the foundation established at the SCHOOL you choose. For that reason we suggest you thoroughly investigate before choosing a SCHOOL.

**T**HE AERO CORPORATION OF CALIFORNIA, INC., has trained hundreds of students who are now actively engaged in AVIATION.

**I**NSTRUCTION given only by LICENSED INSTRUCTORS in new and modern LICENSED EAGLEROCK PLANES.

**W**E urge you to INVESTIGATE. OUR SCHOOL by filling out and mailing the enclosed coupon.

### THE AERO CORPORATION OF CALIFORNIA

Incorporated

9819 So. Western Ave., Los Angeles

I am interested in your school.

Name .....

Address .....

City..... State.....

# MODERN FLIGHT

STUDENT PILOTS and young men about to enter the game can cut down the number of hours usually necessary before soloing by a study of the greatest flying instruction book of the year, "Modern Flight".

### MASTER PILOT CLEVINGER

out of the wealth of his 10 years' flying experience, explains in simple, interesting language, every movement of the controls for take-offs, landings, straight flight and aerobatics.



## SAVES YOU \$50.

*when you LEARN TO FLY*

The ambition of every flying student is to be able to handle a ship alone in the least time possible. Purchase of Clevenger's "Modern Flight" is a long step in that direction.

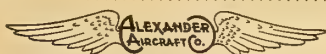
### HERE IS MY DOLLAR

Gentlemen:

Rush copy of Clevenger's complete flying course.

Name .....

Address .....



Manufacturers of the Eaglerock

Room 403, Alexander Industries Inc., Colorado Springs, Colo.



---

# LOCKHEED AIRCRAFT

**THE CHOICE OF VETERAN PILOTS  
AIRLINE OPERATORS AND DEALERS**



**With pardonable pride we  
announce the appointment of  
Schlee-Brock Aircraft Corpo-  
ration, 2008 Fisher Building,  
Detroit, Michigan, Lockheed  
Aircraft Distributors for cen-  
tral and southern portions  
of the United States.**

**LOCKHEED AIRCRAFT COMPANY**  
**L O S   A N G E L E S ,   C A L I F O R N I A**

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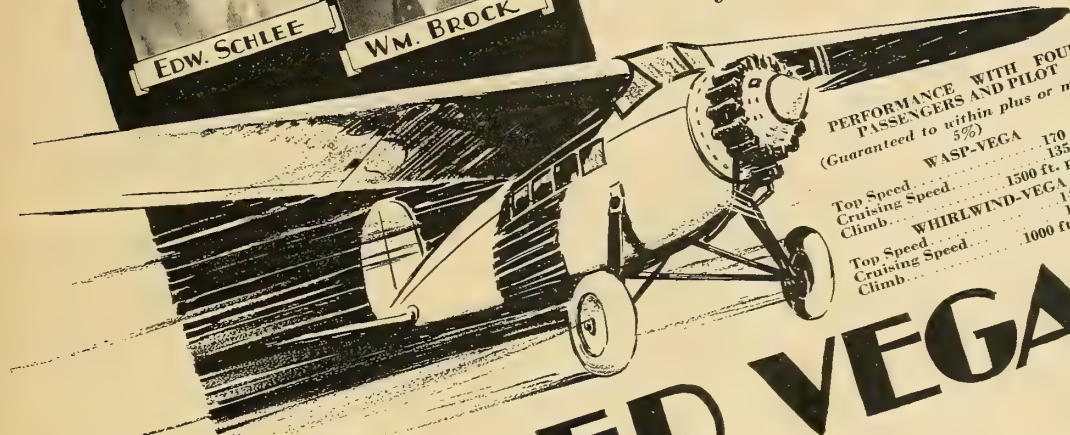


# SCHLEE-BROCK AIRCRAFT CORPORATION

**Appointed As  
Distributors**

**in the Mid-Western  
and Southern States**

*for the . . .*



**PERFORMANCE WITH FOUR  
PASSENGERS AND PILOT**  
(Guaranteed to within plus or minus  
5%)

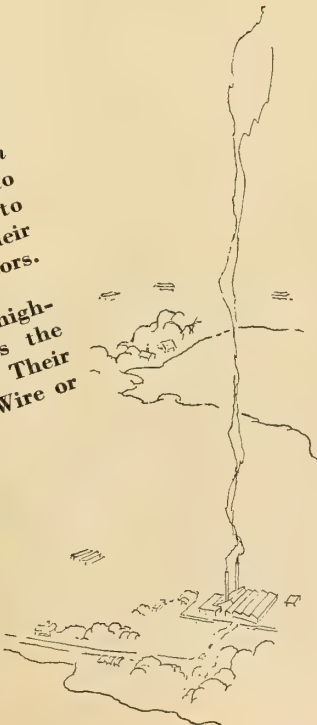
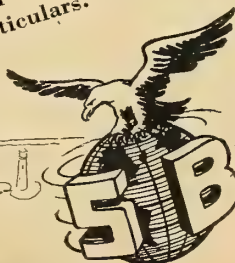
<b>WASP-VEGA</b>		170 m.p.h.
Top Speed	1500 ft. per min.	135 m.p.h.
Cruising Speed		
Climb		
<b>WHIRLWIND-VEGA</b>		140 m.p.h.
Top Speed	1000 ft. per min.	118 m.p.h.
Cruising Speed		
Climb		

# LOCKHEED VEGA

SCHLEE and BROCK—world and endurance fliers—from a background of long experience, careful observation and constant comparison—have chosen Lockheed Vega planes to distribute.

It was a Lockheed Vega plane in which Wilkins made his hazardous flight across the North Pole and now has on his South Pole expedition; the plane that holds both transcontinental speed records—East to West and West to East. This is the plane to which Schlee and Brock have added their indorsement—in becoming its distributors.

Schlee and Brock are establishing a high-grade dealer organization. Perhaps the franchise in your territory is open. Their unusual plan will interest you. Wire or write for particulars.





# THE AIR SERVICES

## D. F. C. AWARDS

**L**IEUT. CARL B. EIELSON of the Air Corps Reserve was awarded the Distinguished Flying Cross for his flight with Capt. Sir George H. Wilkins across the Arctic from Point Barrow, Alaska, to Dead Man's Island, Archipelago of Spitzbergen, on April 15-16, 1928, without a stop, a distance of more than 2,200 miles.

**L**IEUT. Oakley G. Kelly, 3rd Pursuit Squadron, Camp Nichols, P. I., was decorated recently with the Distinguished Flying Cross by the Commanding General of the Philippine Department, Major-General Wm. Lassiter.

**MAJOR** ROSS E. ROWELL, who for two years commanded the marine air force in Nicaragua, has been awarded the Distinguished Flying Cross.

## SCHIFF TROPHY AWARD

**T**HE Herbert Schiff Memorial Trophy, awarded annually to the pilot in the United States Navy who flies the greatest number of hours without accident during the year, was presented on December 15 by President Coolidge to Lieutenant James E. Dyer.

The Schiff trophy, established in 1925 by the family of Lieutenant Herbert Schiff of New York, who was killed in line of duty at Hampton Roads, Va., on July 11, 1924, has been awarded to: Lieutenant R. D. Thomas in 1925 for flying 583 hours and 43 minutes; in 1926 to Captain H. Denny Campbell for 839 hours and 40 minutes, and in 1927 to Lieutenant Arthur Gavin for 865 hours.

Lieutenant Dyer, who is stationed at San Diego, Cal., exceeded previous records by flying 1,251 hours and 15 minutes without injuring himself, a passenger or a plane.

## AIR CORPS REFUELING ENDURANCE FLIGHT

**A** REFUELING endurance flight will be started by the Army Air Corps from Mines Field at Los Angeles shortly after dawn on New Year's Day.

The personnel of the mission is as follows:

Endurance plane (Atlantic C-2 Army transport monoplane with three J-5 air-cooled engines, named the *Question Mark*): Major Carl Spatz, Captain Ira C. Eaker, Lieut. Elwood R. Quesada, and Lieut. H. A. Halverson, pilots; Sergeant Roy Hooe, mechanic.

Refueling plane No. 1 (Douglas C-1 Army transport with a single Liberty motor): Captain Ross G. Hoyt, pilot, and one more officer to be selected at San Diego.

Refueling plane No. 2 (Douglas C-1 Army transport with Liberty motor): This plane and its crew will be arranged for at San Diego.

Ground personnel: Lieut. Ray Harris, engineering officer; Hans J. Adamson and Lieut. Arthur Ennis, in charge of communications with the plane.

The purpose of the experiment is not only to put modern airplane engines to the acid test of absolute endurance and to determine the strain of flight on the human system over a protracted period, but, to investigate the practical value of refueling in military as well as in commercial aviation. Bombardment planes, for instance, would be given a wider radius of action, while commercial airplanes, owing to decreased fuel weight, would be able to carry greater payloads if refueling can be adopted as a routine function in aviation.

Preliminary research along these lines was made five years ago when Lieuts. Lowell H. Smith and John P. Richter con-

ducted experiments which had their climax in a border to border flight along the Pacific coast in 12 hours and 13 minutes. This flight furnished opportunity for the transfer of 125 gallons of gas. Prior to this test, the same two pilots remained in the air for almost 24 hours in an ordinary D-H observation plane by means of refueling.

The present tests and those staged five years ago differ in several respects. In the first place, the 1923 endurance plane had only one motor while the *Question Mark* has three. The largest quantity of gas transferred in the 1923 trials was 125 gallons, while about 900 gallons must be poured into the tanks of the 1929 endurance ship between dawn and dusk every day. Two men sat in open cockpits in 1923, while five men will enjoy a larger measure of comfort in comfortable wicker chairs, books, radio and a small electric stove.

Two officers will be on duty in the pilot's compartment as long as the flight lasts. Inasmuch as Major Spatz will attend to the transfer of supplies and Captain Eaker will be at the wheel during the contact periods—of which there will be from three to six a day—these two officers will pilot the ship during the daytime while Lieutenants Halverson and Quesada will be at the controls at night.

The refueling plane has two 150-gallon gas tanks and one 40 gallon oil tank in its passenger compartment. The two gas tanks are joined with a 4-inch pipe to which is fastened a 50-foot hose with a diameter of two and a half inches. A similar hose is attached to the oil tank. Ropes for lowering food, water, messages and other supplies have been provided.

Two gas tanks and an oil container similar to those in the refueling plane have been installed in the endurance ship. A

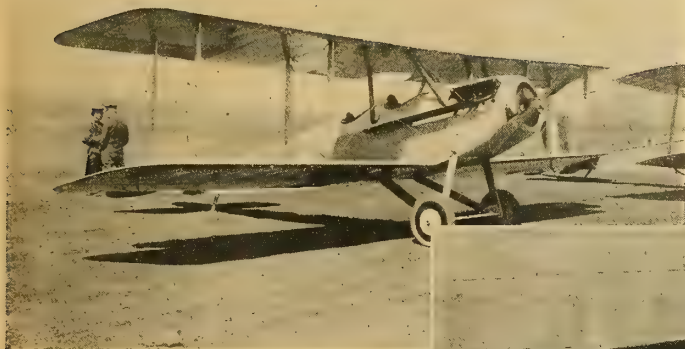
(Continued on next page)



Left—Army C-1 (Douglas) interior showing gas tanks, release valve and refuelling hose. Center—C-1 about to make contact with C-2. Right—C-2 (Fokker) interior showing auxiliary gas tank refuelling apparatus and sleeping berths.

# TWELVE YEARS OF PROGRESS

## 1917-1929

*Above*

**1918—The VE-7**, the first product of the Vought Organization. Winner of the War-Time Advanced Training Plane Competition.



### VOUGHT PLANE FLYING HOURS

For the fiscal year 1928 in U. S. Navy—29,371 hours, or approximately 3,522,000 miles—twice that done by planes of any other manufacturer.

*Below*

### 1929 — O2U-2 CORSAIR

Five-Purpose plane. Powered with a Pratt & Whitney "Wasp" 425 H.P. Engine.

**I**N 1917, the Chance Vought Organization was commissioned by the U. S. Army Air Service to design and build a modern two-seater—with pursuit performance—for advanced training.

This plane was produced and delivered on the field for tests in the short space of three months.

In open competition against the aircraft industry, this plane won the Army Competition held to select the best advanced-training plane producible. In fact, the official verdict was, "Easily the best."

In 1927, after ten years of service to the U. S. Army and Navy Departments, the Chance Vought Organization was honored with one of the largest orders ever placed for any single new model plane. The U. S. Navy Air Service ordered seventy Chance Vought Corsairs to be built and delivered.

1929—Today the Vought Corsair is the official plane of practically every ranking officer in the U. S. Naval Air Service.

# CHANCE VUGHT CORP.

## LONG ISLAND CITY, NEW YORK



### THE "CORSAIR" HOLDS FOUR WORLD RECORDS

Class C—Seaplane with 1102 lbs. ballast:

1. For Altitude.
2. Speed for 100 kilometers.
3. Speed for 500 kilometers.

Class C—Seaplane:

1. Speed for 1000 kilometers.



(Air Service continued)

berth has been built on top of each tank while a third cot has been constructed over the oil tank. The gasoline will be pumped by hand from the special fuel tanks into the regular tanks in the wing of the ship.

During refueling periods, the two ships will come within 17 feet of each other, the endurance plane flying beneath and slightly behind the supply ship. Major Spatz—wearing goggles, rubber face mask, rubber gloves and a rubber raincoat—will stand on a small platform built in the entrance compartment of the ship. This will place him shoulder high in the opening that has been cut in the top of the ship at this point. As the hose is lowered from the plane above, Major Spatz will catch it, pull it through the opening and turn a valve. The gasoline will then pour into a reception funnel immediately beneath the mouth of the hose, at the rate of 75 gallons per minute, and run through two 4-inch pipes into the two 150-gallon tanks. Three hundred gallons will be taken aboard at each refueling period.

The average speed of the *Question Mark* will be about 90 miles an hour with the engines turning approximately 1,350 r.p.m. The cruising height of the ship will be between 2,000 and 3,000 feet during the day and from 5,000 to 7,000 feet at night. The ship will carry a barograph which will register the endurance of the flight and provide an official record of the time spent in the

air. Radio telephone equipment will also be carried.

Refueling plane No. 1 will be stationed at San Diego after the first refueling contact over Los Angeles has been made. Refueling plane No. 2 will be at El Centro, ready to refuel in case of bad weather along the coast or to "pinch hit" for No. 1, should the latter plane be out of commission.

## ELABORATE AIR MANEUVERS FOR NEXT SPRING

THE Air Corps maneuvers for the spring of 1929 will be conducted on the most elaborate scale thus far attempted in the history of this branch of the military establishment. Air demonstrations will be given at the various Service Schools of the Army, and in a maneuver at Kelly Field, Texas, at least 200 airplanes will participate.

War strength squadrons of Pursuit, Bombardment and Attack aviation will stage demonstrations at Fort Bragg, N. C.; Fort Benning, Ga.; Fort Sill, Okla.; Fort Riley, Kansas, and Fort Leavenworth, Kansas. These demonstrations will be similar in scope to those given in the spring of 1928.

At the completion of these demonstrations, all available Air Corps units will be concentrated by air in the vicinity of Wright Field, Dayton, Ohio, and Norton Field, Columbus, Ohio, to conduct a two-sided Air Corps maneuver. The units participating in this maneuver will be the First

Pursuit Group from Selfridge Field, Mt. Clemens, Mich.; the Second Bombardment Group from Langley Field, Va.; the Third Attack Group from Fort Crockett, Galveston, Texas; the 9th Observation Group from Mitchel Field, N. Y.; the 11th Bombardment Squadron and the 95th Pursuit Squadron from Rockwell Field, Coronado, Calif.; the 15th Observation Squadron from Selfridge Field, Mich.; the 16th Observation Squadron from Marshall Field, Fort Riley, Kansas; the advanced class of the Air Corps Flying School at Kelly Field, San Antonio, Texas, and the Air Corps Tactical School at Langley Field, Va. It is contemplated that this two-sided maneuver will be conducted with at least 100 airplanes on each side. These operations will continue for a period of approximately five days, after which these units will operate as the Air Corps of an Army under the command of Major-General Dennis Nolan, commanding the Fifth Corps Area. The Corps Area Staff will function as the Staff of the Army.

This last phase of the maneuvers will consist of a theoretical war problem in which ground troops will be simulated and air troops will be actual. Upon completion of this problem the various units will return to their home stations.

It is calculated that the average distance each unit will travel in all phases of these maneuvers from its home station to the scene of the activities will be approximately 4,000 miles.



# SCINTILLA



## SCINTILLA AIRCRAFT MAGNETOS on the "WHIRLWIND"-EAGLEROCK

A great combination! The new Eaglerock Biplane . . . . . the Wright "Whirlwind" motor . . . . . two Scintilla Magnetos. The "Whirlwind" is used in the Eaglerock because there is no question of its remarkable performance and dependability. For the same reasons Scintilla magnetos were chosen by Wright engineers as standard equipment on the "Whirlwind."

SCINTILLA MAGNETO COMPANY, SIDNEY, NEW YORK

Contractors to the U. S. Army and Navy

# Even after 1340 miles the tank was full of good oil

WICHITA ★

★ ALBANY

Student Instruction

Cross-Country Flying

## FLYERS INCORPORATED

399 STATE STREET  
ALBANY, NEW YORK

Travel-Air Dealers for Central and Northeastern New York

August 22, 1928.

Kendall Refining Company,  
Bradford, Penna.

Att. Mr. I. H. Shearer.

Gentlemen:

Both Mr. Harned and myself were extremely disappointed that our recent attempt of a non-stop flight from Wichita, Kansas to Albany, N. Y., was not successful. However, we did demonstrate to ourselves, if to no one else, several outstanding and very pertinent facts.

To begin with, we took off from the Wichita airport with 1943 pounds useful load. The run for takeoff was 1300 feet and required 14 seconds. The total length of trip was 1340 miles requiring a total flying time of 15 hours 4 minutes. On this trip we consumed a total of 130 gallons of gas. Before leaving Wichita we drained the oil tank and filled with Kendall "J" Oil as is our usual practice. The oil tank was filled flush to the spout. At every stop along the way we kept checking the oil but found this was a most unnecessary procedure. The sum and substance of our oil observations were these: It was absolutely impossible to add any oil at any place on the trip and upon our arrival in Albany, one quart would have been far too much oil. This oil when drained from the tank at Albany was in the most excellent condition, as usual.

While you no doubt were extremely disappointed with us, that we were unable to carry out the original purpose of this trip, I know you will find extreme satisfaction in this information.

Very truly yours,  
FLYERS, INCORPORATED

*Robert Aldrich*

Robert Aldrich, President.

RA:B

"Fly with Flyers"

**A high standard  
of performance — but then  
Kendall Penzbest speci-  
fications are high**

In this letter, shown here, Bob Aldrich tells of his flight with Owen Harned in a Travel Air Cabin Monoplane from Wichita to Albany—1340 miles. At the end of the trip his lubricating oil—Kendall Penzbest—was found to be in "the most excellent condition, as usual." And it was the same oil that he started with—none added.

Kendall Penzbest Oil is the natural selection of pilots for use in tests of speed and endurance. The high standard of performance of Kendall Penzbest in the National Air Tour, Transcontinental Air Derby, Los Angeles to Cincinnati Air race and in other important events in recent months was, frankly, to be expected. For Kendall Penzbest specifications are high. The change period is 30 hours, and even when drained Kendall Penzbest is found to be in better condition than the average oil after 15 hours.

The splendid quality of Kendall Penzbest is understood when it is realized that it is derived entirely from the Bradford Grade, the finest of all Pennsylvania Oils, and is perfected by a refining process so highly developed that every bit of wax and other impurities is extracted.

In freezing temperatures especially is an oil of such pronounced purity as Kendall Penzbest doubly appreciated. Kendall Penzbest will not congeal. It flows instantly the engine is started. It need not be warmed up at stops. It insures smooth performance — increased power — freedom from repairs and delays.

This winter let Kendall Penzbest Oil add increased speed, ease, safety and economy to your flight. For a list of airports where Kendall Penzbest is now obtainable, address Aviation Division, Kendall Refining Company, Bradford, Pa.



# KENDALL PENZBEST MOTOR OIL



REFINED FROM 100% BRADFORD  
GRADE OF PENNSYLVANIA CRUDE



# At Last!



## An Airplane for Everybody!

### GUARDIAN Lightplane Solves the Problem!

**T**HOUSANDS of Americans have wanted an airplane that was economical, practical, safe. A ship that would bring flying down to everybody!!

Here it is! The Guardian Lightplane has been developed by an American Aeronautical Engineer from one of the most famous and successful lightplanes in Europe. This famous engineer was for four years with one of the largest factories in America. He has a record of eight years' designing, building, and flying success behind that! He has taken a successful European lightplane and developed it for American needs.

The Guardian is rugged, powerful, safe. Its design is simplified. It has a safety factor of 8! It is the simplest and lowest-powered practical airplane in America.

#### BUILD IT YOURSELF!

It has been especially designed so it can be built by any mechanically inclined young man who will follow the instructions and plans furnished.

Think of building an airplane yourself—from easy-to-understand plans prepared by a graduate aeronautical engineer with 12 years' experience! Think of equipping this with a low powered engine and flying it yourself! Think of an airplane strong enough for stunting, with a ceiling of over 10,000 feet, a speed of over 80 miles an hour—that you can build yourself for only a few hundred dollars!

#### Complete Plans \$5.00

We want a thousand Guardians built and flying by spring. Spend the next month or so constructing one! It's easy! Send \$5.00 *today* for a complete set of working drawings showing all details and dimensions of this practical two-seater lightplane, together with full instructions for building it, a recommended list of the kinds and types of motors you can get cheaply to install in it, and suggestions as to obtaining 50 to 200 hours flying time for a Commercial or Transport license.

You can build it in a few weeks at home with a few simple tools. The Guardian has a modern steel tube fuselage and simple, strong fittings especially designed for the amateur builder. You can build a Guardian complete, and get in enough flying time for a license, for a small fraction of the cost of attending a flying school! Send \$5.00 *now* for a complete set of plans and all particulars, and get started before your friends beat you to it! Satisfaction guaranteed!

### Send Your Order Today!

**GUARDIAN AIRCRAFT  
COMPANY**

1567 ARCADE BLDG.

ST. LOUIS, MO.

#### SPECIFICATIONS

Span: 28 feet.

Length: 19 feet.

Weight Empty: 400 lbs.

Top Speed: 85 m.p.h.

Landing Speed: 32 m.p.h.

Capacity: Pilot and Passenger.

Type: Monoplane.

Power: As a single-seater, 20 H. P. As a 2-seater, 35-40 H. P.

### Get Started Now!

Now is the time to get started building. You can put in time for a Commercial License, have hours of fun and sport flying yourself and carrying your friends. You can fly cross-country and make money in aviation.

Be the first in your district to build and fly this sensational monoplane. *For the first purchaser of plans in each town* we have a special offer to represent us with a discount on all later plans, parts, and supplies sold to other builders. Send your order today and get your ship in the air in time to make big money on this flood of Lightplane business that is beginning to sweep the country. Mail your order at once!

#### Guardian Aircraft Co.

1567 Arcade Bldg.  
St. Louis, Mo.

I enclose \$5. Please send me post-paid a complete set of working drawings of the Guardian Lightplane, building instructions, and other material and suggestions as advertised in AERO DIGEST.

Name .....

Address .....



# Pilots trained only for success

## And a Job For Our Graduates!

*As another step toward absolute supremacy in aviation training and in preparing glorious futures for our graduates—we announce—*

that Parks Aircraft, Inc., the new \$2,000,000 manufacturing corporation will give every student who enrolls during January, 1929, a position in turn as pilot when he graduates and receives his Limited Commercial License!

There are no strings to this offer. Pilots are vitally needed. They must be obtained or production must slow down.

The first \$175,000 unit of the Parks Factory is up—the first Parks ships are in the air!

The whole aviation industry faces a shortage of men. No wonder pilots are making from \$700 to \$1500 per month!

And Parks training, acknowledged the leader, costs no more than in ordinary schools.

### FULL TRAINING

At Parks Air College you are taught straight flying, acrobatics, forced landings, vertical banks, cross wind landings, cross country flying, recovery from spins, and other flight details, by nationally known transport pilots.

And in addition to flying, a pilot must know aerial navigation, meteorology, aerodynamics; be familiar with such famous engines as Whirlwind, Caminez, OX5, Velie, Wasp and others. You must know how to take care of your own ship! All this is included at Parks Air College!



Every student, regardless of the class of license he is trying for, receives training in all ground subjects necessary to qualify for a Transport License!

### PRICES GOING UP!

On February 1st, all prices go up! Don't miss this opportunity to save over a hundred dollars on your training and guarantee yourself a job when you graduate. Alert, wide-awake students will leave at once for Parks Air College and start their training that practically guarantees success. If you have never visited our school, never seen our catalog and do not know any graduate who can give you full information—then wire at once for a free copy of "Skyward Ho!" our inspiring catalog that gives all information about our courses and answers all your questions.

### DON'T WAIT

But delay will cause you to miss this golden opportunity. You



must be in school in January to get the special rate and be sure of a job when you graduate. Opportunity knocks—is here—and gone! Leave at once for Parks and success, or wire immediately for "Skyward Ho!"

# PARKS AIR COLLEGE, Inc.

202-L Missouri Theatre Bldg., St. Louis, Mo.





## MUCH TALKED ABOUT

This racy looking Stearman biplane has been the subject of much discussion on the West Coast. It is a stock job, except for a few special features—such as the Menasco power plant—which give it the appearance and performance of a pursuit ship.

The letter reproduced here, from the owners of the ship, states clearly what is thought of this powerful superposed engine.

“... exhaustive flight tests totalling 200 hours . . . extreme satisfaction.”

“... in competition with several other well known makes . . . has demonstrated its superiority.”

“... particularly gratified by the low upkeep cost . . . gas and oil consumption having been very low . . . general maintenance cost almost negligible.”

\$3,250 F.O.B. Los Angeles  
—need more be said?

**MENASCO MOTORS**  
COMPANY  
6718 McKinley Ave.  
Los Angeles, California

### CHADBOURNE-DONZE AIR SERVICE, INC.

Aviation in All Its Branches  
SANTA BARBARA AT CARTHAGE  
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November 21, 1928.

Menasco Motors,  
6718 McKinley Ave.,  
Los Angeles, Calif.  
Gentlemen:

Having subjected the Menasco engine to exhaustive flight tests totalling 200 hours, we feel in a position to express our extreme satisfaction.

In competition with several other well known makes, which are being used by us, this motor has demonstrated its superiority in every respect.

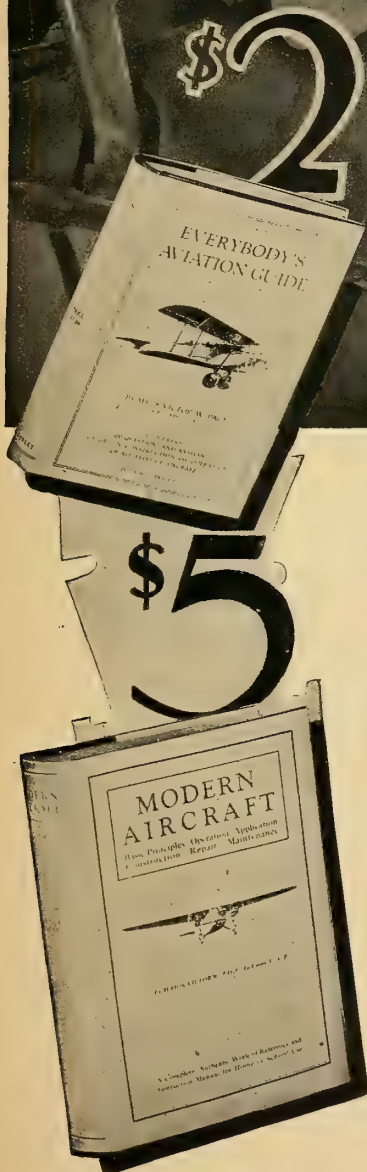
We are particularly gratified by the low upkeep cost this motor has shown, the gas and oil consumption having been very low for the horse-power developed, and general maintenance cost almost negligible.

You may use the above for advertising purposes if you so desire.

Very truly yours,  
Harry A. Chadbourne  
H. A. C. Chadbourne

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Richard Arlen in  
"Wings," Courtesy  
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# STENOGRAPHIC REPORT

INTERNATIONAL  
CIVIL AERONAUTICS  
CONFERENCE, D. C.  
DECEMBER 12-13-14, 1928

**T**HIS is the most important Aeronautical Conference ever held in this country. By arrangement with the U. S. Government we are permitted to sell copies of the stenographic report to anyone who may desire to order them.

We are making only a limited number of copies. If you desire to order the transcript please fill in the order blank below and send to us immediately.

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42 Broadway, New York City

December 17, 1928.

Convention Reporting Co.,  
42 Broadway, New York City.

Please send us (me) ..... copies of the verbatim report of the International Civil Aeronautics Conference, held in Washington, D. C., December 12, 13 and 14, 1928, for which we (I) shall pay you 25c per page for each copy ordered.

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## HERE we shall go on building good ships

It is called the new Mahoney-Ryan factory. We think of it as a pledge given permanent form in masonry and steel. It is a mile-stone in the march of a young industry now coming of age.

This modern, daylight plant adjoins Lambert Field, the great airport of St. Louis, Missouri. The site covers nine acres. Provides every known facility for the production of trustworthy ships.

And now in quantity production is the new Mahoney Ryan Brougham which will carry six in comfort and security when powered by the Wright Whirlwind J-6 engine, 300 horsepower, or five with the J-5 Whirlwind.

Built into this ship are the engineering principles proved sound in the world's greatest endurance flights. In cabin refinements, it approximates the luxury of a high class motor car. It delivers ten miles to the gallon of gasoline,

and its safe cruising radius is eight hundred miles.

*The Mahoney-Ryan Brougham takes off faster and lands slower, with its full load, than any other plane of its type. It is the only plane of its type with a service ceiling of over 16,000 feet. It is the only plane powered with one engine that has lifted a useful load of 2,500 pounds from a field 7,600 feet above sea level.*

These facts have been demonstrated in open competition, they are beyond dispute. Because of these facts,

the Mahoney-Ryan Aircraft Corporation builds and sells more Whirlwind cabin monoplanes than any other maker. This volume makes possible the attractive price.

Send for descriptive booklet, fully illustrated, which is gladly forwarded upon request.

**A**FTER completing his New York to Paris flight, Col. Lindbergh said: "I had what I regarded and still regard as the best existing plane to make the flight." The Mahoney-Ryan Brougham is a Sister Ship, further developed and refined, adapted to the most searching demands of commercial air travel or personal use. U. S. Department of Commerce Approved Type Certificate No. 25.

### Present representation includes these leading distributors:

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MISSION AIRPLANE SERVICES, San Antonio, Texas

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In territory not yet taken up, we offer an attractive proposition to distributors qualified to handle the line. Correspondence invited.

*The* **MAHONEY - RYAN AIRCRAFT CORP.**  
ANGLUM (St. Louis County), MISSOURI

Owners of Ryan Air Lines  
San Diego, Cal.



and Ryan Flying Company  
St. Louis, Mo.



# AERONAUTICAL INDUSTRY

## 1929 AIRPLANE AND BALLOON RACES

THE National Balloon races will be held at Pittsburgh, Pa., on May 4, 1929, and the Gordon Bennett international balloon races at St. Louis, Mo., on October 1, according to a recent decision of the contest committee of the National Aeronautic Association. The 1929 National Air Races will take place at Cleveland, Ohio, between August 24 and September 2.

The committee also sanctioned a new air speed contest, to be held at St. Louis on May 28 to 30, to be known as the Gardner Cup race, consisting of five cross-country contests as a preliminary to the final race, from Parks Field, East St. Louis, Ill., to the Indianapolis Speedway and return, the winner to receive a cash prize of \$5,000 and the trophy.

Miami, Fla., will be the scene of an air meet January 7-8, in which commercial types of planes will compete for cash prizes of \$6,780.

## ALEXANDER COMPANY'S ESSAY CONTEST

THE Alexander Aircraft Company is conducting a contest for the best articles on aviation submitted for publication in the "Alexander Aircrafter," house organ of the company. The contest begins January 1 and ends May 1. The winner will be awarded a 4-year course in aeronautical engineering or business administration with an aeronautical background, or, if he chooses, he may receive a new Eaglerock plane. Papers on technical or non-technical phases of aeronautics, ranging in length from 400 to 600 words, are qualified for competition and should be submitted on the first of each month to the contest committee of the Alexander Aircraft Company, Colorado Springs.

The candidates for the awards outlined above must be enrolled in an undergraduate course in a standard college, either liberal arts or professional. However, to a certain number of candidates who do not qualify as specified, but who through their outstanding qualifications ought to receive some encouragement in aviation, the Alexander Aircraft Company will award several ten-hour flying courses. Such awards will be judged, not only on a series of short papers submitted by the candidate, but also on evidence of the candidate's disposition to scholarship and his personal fitness. The candidate must submit a preliminary letter of application setting forth his present educational status, age, sex, his plans for the future, etc.

Request for information and rules of competition, and preliminary applications must be submitted to Darell Boyd Harman, secretary, committee on awards, Alexander Aircraft Company, Colorado Springs, Colo.

## THE ZIMMER AIRWAY MARKING SYSTEM

LUDO L. ZIMMER of Cleveland has devised a simplified and uniform system of airway marking. The system is worked out in the form of a code, by which locations may be designated in three digits only. This makes possible the marking of small roofs in all towns at a small cost. By this system, the entire country is divided and subdivided into sections, each designated by a letter or number, and location may be determined from the air by reference to the numbered section divisions on a map. An advantage of this method of marking is that the identification of location is not confined alone to cities and towns, and saves the flier from following a zig-zag route, since any roof in any location is sufficiently large to be marked with three digits. Also, such marking cannot possibly be confused with the many advertisements which are now being painted on roofs in towns and cities.

## MENDEZ' NEW YORK-BOGOTA FLIGHT

LIEUT. BENJAMIN (BENNY) MENDEZ, of the Colombian Army Air Corps, who accepted a gas boy's labors at Curtiss Field four years ago so that he might learn aviation, hopped off at 7:40 a. m. November 23, from Rockaway Naval Air Station, N. Y., bound in five hops for Bogota, Colombia, 4,600 miles southwest. Mendez was accompanied in his Curtiss Falcon seaplane, *Ricaute*, bought for him by his homeland for the flight, by John Todhunter, his mechanic.

The first leg of his flight, to Jacksonville, Fla., was completed in 8 hours 40 minutes. From there he flew to Havana, Cuba, and to Puerto Barrios, Guatemala. On landing at Colon, his plane submerged in the bay and was damaged. He will continue his flight as soon as repairs are made.



Filling the oil tanks in Capt. Wilkins' Antarctic Lockheed Vega.

## 1929 ALL-AMERICAN AIRCRAFT SHOW

THE second annual All-American Aircraft Show will be held in Detroit, April 6-14. The men and the organization responsible for the success of last year's All-American show are behind the 1929 renewal of this classic, and their plans call for an exposition that will eclipse its forerunner in many respects.

The committee in charge consists of Edward S. Evans as chairman, William E. Metzger, vice chairman; Harry R. Graham, W. Magruder Jones, Eugene W. Lewis, William B. Mayo, and Captain L. M. Woolson. Ray Cooper, secretary of the aircraft bureau of the Detroit Board of Commerce, continues as manager.

The Show will be held under the auspices of the aircraft bureau of the Detroit Board of Commerce in conjunction with the Aeronautical Chamber of Commerce of America.

## WORLD RECORDS

GERMANY and the United States hold equally between them 64 of the 106 established world records for balloons, airships, airplanes, light planes and seaplanes. The remaining records are divided among 7 other countries. Here is the official score:

Germany .....	32	Czechoslovakia ....	3
United States ....	32	Hungary .....	2
France .....	20	Switzerland .....	2
Italy .....	8	Belgium .....	1
Great Britain .....	6	Total .....	106

Eighteen of America's list are in the seaplane classification and 11 are for balloons; 2 for airplanes and 1 for light planes. The only standard land airplane records held by America are for altitude and speed. One was made in 1927 and one in 1925. The light plane cross-country distance record was made by the late Harry J. Brooks, from Detroit to Titusville, Fla., 1564 kilometers, February 21, 1928.

## WILKINS FIRST TO FLY IN ANTARCTIC

LATE in November, Capt. Sir George Hubert Wilkins and C. Ben Eielson made the first flight of an airplane in the Antarctic. Capt. Wilkins sent radio messages, which told of the flight, to the Lockheed Aircraft Company, the Vacuum Oil Co., and the Wright Aeronautical Corporation. (The expedition is using two Lockheed Vega monoplanes powered by Wright 220 h.p. Whirlwind engines, which are lubricated by the Vacuum Oil Company's Gargoyle Mobiloil.)

This first flight took place just two months after the expedition left New York, September 22. The supply ship, *Hektor*, with the two planes aboard, left Montevideo on October 24. On November 18, it reached Deception Island, where the main base of the expedition has been established.



The advertisement features a large illustration of a biplane flying over a curved path that leads into the distance. A flock of birds follows the path, suggesting speed and direction. The background is a cloudy sky.

# THE **Leader**

Finish Design Performance

## *The* **Command-Aire**

..... A masterpiece in aircraft art!  
 ..... A ship supreme in Beauty—Endurance—Smartness  
 of Design—Quick take-off—Rapid climbing ability—  
 and Unusual Stability  
 ..... Truly the Leader of Man's winged creations!

Sole North American distributors for  
 the **PHYLAX AUTOMATIC FIRE**  
**EXTINGUISHER** for airplanes

Approved Type  
Certificate, No. 53

**COMMAND-AIRE, Inc.**  
**LITTLE ROCK**



## RECOMMENDATIONS FOR IMPROVEMENT IN THE FLYING SCHOOL SITUATION

THE Aeronautical Chamber of Commerce, through its Flying School Committee, which was appointed at the request of the Aeronautics Branch of the Department of Commerce, has made public minimum requirements for flying schools to be classified as recognized members of the Chamber.

The temporary committee consisted of C. S. Jones, New York (chairman); Oliver L. Parks, St. Louis, and Tex Rankin, Portland, Oregon. This committee requested the Chamber to distribute a questionnaire among schools advertising themselves as giving either ground or flying instruction. Responses to this questionnaire confirmed the general conviction that the flying school situation required the constructive attention of the industry as a whole. Both the Department of Commerce and the industry have been aware for a long time of the need for improvement of the manner in which flying instruction is made available to prospective purchasers of airplanes.

A Flying School Conference, under the auspices of the Aeronautical Chamber of Commerce, was called in Chicago, December 4. This conference was attended by some twenty-five or thirty representatives of the flying school.

Data revealed by the questionnaire received by the Chamber formed the basis for general discussion. It was recommended that a permanent Flying School Committee be established within the Aeronautical Chamber of Commerce to carry out the recommendations of the conference.

The conference then recommended that the executive committee of the Chamber recognize the following permanent flying school committee to consist of nine members, one each from the six geographical divisions of the Chamber, two at large and a chairman. The personnel of this committee as proposed to the Chamber is as follows: Philip R. Love, St. Louis, Missouri, chairman; C. S. Jones, Garden City, N. Y., representing the Eastern Division, centering on New York; Jack Stinson, Detroit, representing the North Central Division, centering on Detroit; Oliver L. Parks, St. Louis, representing the Great Lakes Division, centering on Chicago; Ted Braley, Wichita, representing the South Central Division, centering on Wichita; Tex Rankin, Portland, representing the North Western Division, centering on Seattle; W. B. Haviland, Minneapolis, representative at large; D. P. Wardwell, Casper, Wyo., representative at large.

Selection of the representative from the South Western Division, centering on Los Angeles, is to be determined by Chairman Love in conference with the vice president from the Los Angeles Division to be elected at the next annual meeting of the Chamber.

The conference emphasized the fact that flying schools operating for the most part within the boundaries of a state did not fall within the control of the Federal Air Commerce Act. It was the sense of the conference that the Chamber could assist

the general situation, however, by setting up standard requirements. Schools would be required to measure up to these requirements before being recognized as members of the Aeronautical Chamber of Commerce.

After a thorough discussion, the conference unanimously accepted the following seven minimum requirements for recognized schools:

1. The minimum flying course to receive recognition qualifies a student for a private pilot's license.

2. All flying instructors must be licensed transport pilots.

3. All airplanes used in school instruction shall be licensed by the Department of Commerce.

4. It was recommended that the permanent committee be instructed to make definite recommendations as to the minimum size of the flying field on which it is safe to conduct a flying school, and also to discuss the question of the operation of the school from a runway field where there is a large volume of transport business.

5. It was recommended that the permanent committee make definite recommendations as to how to control the misleading advertising now used by many schools.

6. A school to be recognized must give ground school courses in the subjects required by the Department of Commerce for a transport license.

7. A daily inspection of equipment must be enforced.

The following resolution was unanimously adopted for submittal to the Aeronautics Branch of the Department of Commerce, regarding the issuance of limited commercial pilot's licenses.

"It is recommended that a student be eligible for examination for industrial or limited pilot's license after having received a total of 50 hours instruction, 25 hours of which was dual instruction and 25 hours solo instruction as an alternative for the present requirement of 50 solo hours."

The conference went on record as requesting that the Chamber advise the Aeronautics Branch of the Department of Commerce of the instituting of the permanent flying school committee and requesting the coöperation of the Aeronautics Branch in the work which is being attempted by the committee.

The conference recommended that on March 1, 1929, the Flying School Committee of the Aeronautical Chamber of Commerce arrange for a duly qualified representative to make an inspection of those schools that are members of the Chamber, or who have requested of the Chamber that they be placed upon the Chamber's recognized list of schools. It was further recommended that, upon completion of this inspection, the Aeronautical Chamber of Commerce make public a list of recognized flying schools. In the enforcement of the above requirements, it was the sense of the conference that moral suasion and the desire for mutual prosperity would constitute the principal incentive toward self-discipline.

## HISTORY OF THE STAR AVIATION COMPASS

THE Star Compass Company of Boston, Mass., was founded in 1905 when it started the manufacture of mariners (spirit) compasses in a small way. However, the company soon had to acquire better equipment and larger quarters and increase its line of compasses from one to eighteen sizes, suitable for use on the smallest boat or the largest ocean going steamer.

As early as 1907, the activities of Lincoln Beachey, who with a cigar shaped dirigible of his own invention was making exhibition flights at Revere Beach, Mass., led members of the firm to consider the possibility of aircraft compasses. In consequence of these flights of Beachey, an aviation compass was developed.

Three years passed, however, before this Star compass could be tried out on an airplane. At that time the first Harvard-Boston Aviation meet was held at Waltham, Mass. This meet brought to the notice of the public Harry N. Atwood, who proved to be the sensation of the meet when he made a flight to the White Mountains. Early one morning in 1910, when Atwood had landed on Franklin Park golf links, the compass was presented to him as an aid for his long distance flights, as they were considered then. He gratefully accepted it, and thus the Star compass came to be used by one of the most noted fliers of the time.

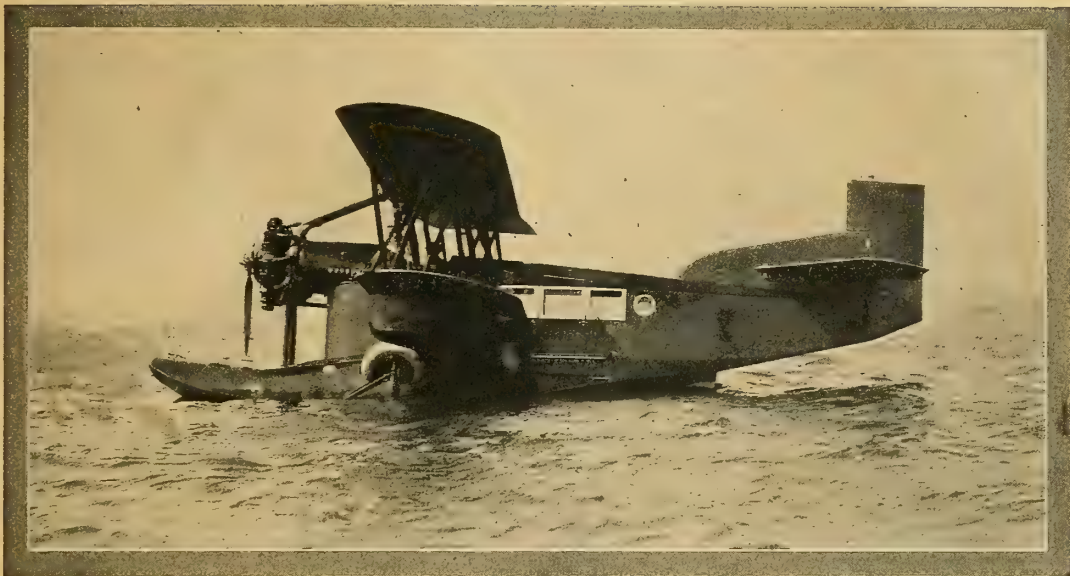
At the second Boston meet, one of these early model airplane compasses was presented to Lieut. Milling. Through his recommendation, the United States Army Signal Corps adopted the Star compass for exclusive use.

During the 1912 Mexican outbreak at Vera Cruz, the Army Signal Corps performed invaluable service, and it was during this campaign that the compass really began to find its place in the aviation world. By this time the Star Compass Company had developed the first vertical dial compass, the luminous treated dial and indirect electric lighting.

By continuous research, the company has kept pace with the changing designs and requirements of an ever changing industry. The most recent of its original improvements is the built-in compensating unit. This is an integral part of the compass, which provides a simple adjustment for deviation and correction, and entirely eliminates the need of loose magnets.

Another improvement was the Star flush mounting compass which eliminates the possibility of the pilot's being injured by being thrown forward against the protruding compass.

It has not been the aviators of the older school alone who have used Star compasses, for this company supplied the magnetic compass equipment for the historic flights of Lieuts. Maitland and Hegenberger. For the Byrd Antarctic Expedition, the Star compass was personally chosen by Commander Byrd. Captain Wilkins not only carried Star compasses into the north polar regions, but he also chose Star compasses for his equally daring exploits into the Antarctic.



## Keystone-Loening Amphibian "Air Yacht"

**C**ULMINATING five years of service during which over 125 Loening Amphibians have flown more than 3½ million miles—Keystone now offers the 1929 Model—

### KEYSTONE-LOENING "AIR YACHT"

Powered by the 525 H. P. Wright "Cyclone"

The experience gained in daily service throughout the world—both military and commercial—made the development of this luxurious cabin amphibian possible. Its performance is unmatched in its class—a truly individual flying machine.

And the factors:

**SAFETY—DEPENDABILITY—  
LOW UPKEEP**

are notable in the new "Air Yacht"

**PERFORMANCE:**

High Speed	130 m.p.h.
Landing Speed	54 m.p.h.
Ceiling	15,000 ft.
Range	550 miles
Pay Load	1,500 lbs.
Capacity, 8 persons.	Price, \$27,900

## Loening Aeronautical Engineering Corporation

31st Street and East River

New York City

DIVISION OF

# KEYSTONE

KEYSTONE AIRCRAFT CORP.  BRISTOL, PENNSYLVANIA

California Representative: W. E. Thomas, 3417 Angeles Mesa Drive, Los Angeles





## FLORIDA AIR NEWS

By JOHNSON WRIGHT

**SERVICE** over contract air mail route No. 25 was begun December 1st by Pitcairn Aviation, Inc., and is being operated in connection with route No. 22. This new line provides 13-hour mail service between Jacksonville and New York, and 16-hour service between Miami and New York.

All ships carried capacity loads on the opening day. Moreover, since there was more mail than one ship could handle, it was necessary to bring an additional ship to Miami to take part of the mail that had accumulated. Elaborate celebrations, in which high officials of city, county, and state participated, were held in Miami, Jacksonville, and Atlanta marking the inauguration of this service as one of the milestones of progress in these cities.

Bad weather necessitated cancelling the air meet and ceremonies scheduled at Jacksonville. Only the first part of the program could be held before the weather became too severe.

Atlanta celebrated not only the extension of the New York-Atlanta line to Miami but also the opening of the Chicago-Atlanta service by Interstate Airlines, Inc. Fairchild cabin monoplanes, Wasp powered, are used on this line, which provides passenger service in addition to mail and express.

Pitcairn PA-5s are used on the Atlanta-Miami line. The pilots who have been assigned to this division are Furman Stone and Thomas Gurley, between Jacksonville and Atlanta, and Fred B. Cann and Fred J. Schwaemmlee, between Miami and Jacksonville. A. P. Kerr is field manager at Jacksonville and also superintendent of the Atlanta-Miami division. George E. Chambliss is field manager at Miami. Both Mr. Kerr and Mr. Chambliss are transport pilots and act as reserve pilots.

Aerial beacons are rapidly being installed on this airway, and just as soon as they are in operation, night flying will be started between Atlanta and Jacksonville. This will enable the schedule to be set up to provide eleven and fourteen hour service between New York and Jacksonville and Miami, respectively.

Pitcairn Aviation, Inc., has announced that the present equipment on the air mail service between New York and Miami will be supplemented during 1929 by luxurious trimotored Ford cabin planes. The first of these big ships will be placed in service early next spring between Greensboro, N. C., and Atlanta, Georgia.

The inauguration of air mail service over the Atlanta-Miami route provided the missing link in fast air mail service between Canada and the United States and Cuba. In January, when the Pan American Airways starts its service between Havana and San Juan, Porto Rico, and Miami and Nassau, Bahamas, Canada and the United States will have connecting air mail service between the Bahama Islands, Cuba, and the West Indies.

**LES LEWIS**, operator of the Hialeah Airways and the 54th Street Airport,

has contracted with Johnny Runger, formerly with Gates Flying Circus, and Miss Norma Stevens of Columbus, Ohio, to make parachute jumps at the airport each Sunday afternoon during the winter season as one of the added attractions.

E. C. Clifford has arranged to operate his three OX-5 Travel Airs from this airport during the winter.

**"MISS NIAGARA,"** trimotored Ford of the Sky View Lines, Inc., has made several survey flights between Jacksonville and other Florida cities. The officials of the company have announced that they are contemplating the establishment of daily service with the ship between Jacksonville and Tampa, making a round trip each day.

**THE** cities of Hollywood and Fort Lauderdale are preparing airports which will be emergency fields for the air mail planes flying between Jacksonville and Miami. The fields will also be utilized by commercial companies. The Massachusetts Airway Company is moving down equipment to be used at the Hollywood airport.

**THE** Miami Airways, Inc., has closed a deal whereby it secured from Capt. W. R. Wright, sales promotion manager of the Command-Aire, Incorporated, the sales franchise of the Command-Aire for the eastern half of the state. The planes used for demonstration are at the 54th Street Airport. Fred W. McKay is president of Miami Airways, Inc., P. C. Latham, vice president; Lawrence S. Latham, secretary; and Henry W. Mittag, treasurer. Cal Latham, a pilot for the Rogers Air Lines for a number of years, is chief pilot.

**GAR WOOD**, internationally known builder and racer of speed boats, has been granted a private pilot's license by the Department of Commerce. Mr. Wood had about 110 hours experience at the controls of his Fairchild monoplane when he was given his tests by Leo C. Wilson, Department of Commerce inspector. George Cobb, who taught Mr. Wood to fly and who has been Mr. Wood's pilot ever since he has owned an airplane, will remain with him.

Mr. Wood has been negotiating for a large Dornier-Wal seaplane, which he expects to secure next summer. He is going to purchase an English light plane to use at the land airports this winter in order to get in time on a landplane.

**THE** Boston Airport Corporation is operating its Hornet-powered Loening cabin amphibian at the Miami municipal seaplane base, located on the Venetian causeway. Henry W. Wickes is pilot of the amphibian, and Frank Sanford is mechanic.

**THE** city commission of Jacksonville has authorized the construction of eight small hangars at the municipal airport. They are to be erected at a cost of \$7,500 each.

**THE** first long air yachting cruise to be made in the Americas was started from Miami December 7th by Joseph Medill Patterson, newspaper and magazine publisher, in his Sikorsky amphibion.

Accompanying Mr. Patterson on the

cruise is his daughter, Mrs. Alicia Simpson, and Floyd L. Gibbons, war correspondent and author of "The Red Knight of Germany."

The first hop was made to Havana on the 7th. From there the party will cross the Yucatan channel and follow the coast to Belize, Mexico. Leaving Belize, they will follow the Lindbergh circle around the Caribbean Sea, stopping and visiting at all principal cities. On the return, they will go around the Gulf of Mexico, up the Mississippi, around the Great Lakes and down to New York. The cruise is expected to take about 60 days and to cover more than 10,000 miles.

The Sikorsky amphibion, which is powered with two Hornet motors, is named *Liberty*. It is piloted by Lieut. F. H. Becker. C. J. Sutter and J. R. Roe are radio operator and mechanic, respectively. The radio equipment which is installed permits both receiving and sending while in the air or on the surface.

**CAPT. O. M. GOODSSELL** and P. H. Leuthi of the Tri-Motor Air Tours, Inc., have made arrangements with the city of Miami for the use of one of the Venetian islands in Biscayne Bay as an airport for their exclusive use during the winter season. They are operating the company's Ford trimotor from this airport, making regular 25-mile education trips over the Miami area.

**BUSINESS** has assumed enormous proportions already on the Pan American Airway's line between Miami and Havana. The mail loads have been as high as 1,800 pounds, and the passenger travel has developed until, during the first week in December, it was necessary to run additional planes, for the number of passengers exceeded the seating capacity of the ship.

The new Fokker F-10s are being received; the hangars and the new \$50,000 passenger station are virtually completed, and the company is rapidly getting ready for the beginning of the Miami-Nassau service and the extension of the Miami-Havana line to San Juan, Porto Rico. The service on these new lines is scheduled to begin on January 9th on which date the new Miami airport of the company, which is one of the most modern and probably the most beautiful and complete in the world, will be dedicated.

### Miami Air Facilities

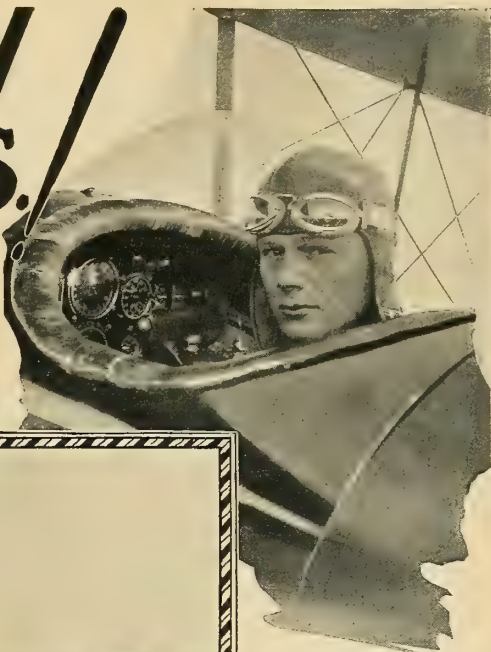
**SINCE** hundreds of private owners, commercial operators, and others have indicated their intention of flying to Miami during the winter, the following brief description of the available airports and facilities there for the aerial traveler is appropriate at this time.

**Municipal Airport:** This airport is located 12 miles northwest of the heart of the city, alongside of the Seaboard Railway and just south of the little city of Opa Locka. It is square and has rock runways, each 2,000 feet long, running northwest to southeast and southwest to northeast. It is

(Continued on next page)

# SPARTAN hops across U.S.

Canada to Key West-  
Non Stop in 17½ hrs.



Lieut. Flo and the SPARTAN in which he made the flight, showing forward cockpit equipped with extra fuel tank.

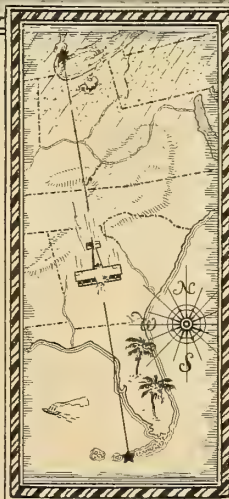


## Walter Engine Proves Real Load Carrier

Piloted by Lieutenant Leonard S. Flo, of the Flo Flying Services, Inc., Ann Arbor, a stock SPARTAN Airplane powered by a WALTER 120-135 H. P. 9-cylinder radial air-cooled engine took off at Walkersville, Ontario, at 11:07 p. m., November 26th, and made a non-stop flight to Key West, Florida—a complete hop across the United States—in 17½ hours.

Though 25 pounds per horsepower has long been considered the maximum possible loading for aircraft, this stock SPARTAN started with a load of 25.8 pounds per horsepower. Despite the excessive load and a freezing temperature, the WALTER Engine negotiated the take-off with entire ease, climbed rapidly, and performed perfectly throughout the long trip.

Only SPARTAN'S superior aerodynamic qualities, and the WALTER Engine's exceptional reliability and efficiency, could have rendered possible this remarkable small-plane performance. For new SPARTAN catalogue, or full information on the WALTER Engine, for which we have exclusive American distributing rights, address



Map of Lieut. Flo's  
Canada to Key West  
solo flight.



Lieut. Flo and Willis C. Brown,  
President of the Spartan Aircraft  
Company and designer of the  
SPARTAN Airplane.



Instrument  
board, indicat-  
ing the special  
navigation in-  
struments in-  
stalled for this  
flight.

# SPARTAN AIRCRAFT COMPANY

TULSA,



OKLA.



(Florida Air News continued)

fully lighted, having a standard aerial beacon, flood, boundary, and obstruction lights. The facilities consist of a hangar, a repair shop, and an administration building. The Curtiss Flying Service and Pitcairn Aviation use the airport.

**54th Street Airport:** This is the most popular flying field in the Miami area because of its nearness to the city and the excellent transportation provided to reach it. It has been used by army, navy, and commercial pilots flying every type of aircraft in use in the United States today. The field is rectangular, with a north and south runway 1,500 feet long and an east and west runway 3,000 feet long. There are no hangars on the field, and it is not lighted. Gas and oil and minor repairs, however, are available at all hours.

**Pan American Airport:** This is a private airport for use of the Pan American Airway's planes. It is complete in every respect. The runways are of rock. It is

available, of course, in event of an emergency.

**Coral Gables Flying Field:** This field is for emergency use only. It is located two miles southwest of the Miami Biltmore Hotel and has two cleared runways, 1,300 and 1,800 feet in length, respectively, and about 75 feet wide.

**Chapman Field:** This is an abandoned army training field, which at present is not in condition for use.

**Municipal Seaplane Base:** This seaplane base is located on the westernmost Venetian Island, which is connected to Miami and Miami Beach by a causeway. The northern portion of Biscayne Bay, which is adjacent to this base, is said to be the largest body of sheltered water for use of seaplanes at any base in the United States. Runways sufficient for any type of seaplane are provided, as well as gas and oil and an administration building. There are no hangars or lights.

**Dinner Key Seaplane Base:** This is an abandoned navy flying base. The concrete runways with asphalt aprons may still be used. There are no hangars or other facilities. This is frequently used for the overhauling of seaplanes.

**Private Seaplane Bases in Miami** are as follows: Chalk School of Flying, on the bend in the county causeway; Rogers Air Lines, Inc., at the foot of N. E. 8th street; Curtiss Flying Service, at the foot of N. E. 6th street.

Any additional information may be secured relative to airport facilities in the Miami area at any time by addressing a letter to A. H. Hermance, Department of Aviation, 311 Courthouse Building, Miami.

#### Repair Facilities

Complete repairs and overhauls for all types, with the exception of all-metal airplanes, may be had at the shops of the Moore Aero Supply Co., 240 N.-W. 45th street. The company has equipment which enables it to repair all types of motors.

#### Prominent Landmarks

Prominent landmarks for the guidance of fliers around Miami are: Tropical radio towers; Hialeah race track; F. E. C. Ry. yards at Hialeah; Seaboard Ry. yards at Hialeah; Flamingo Hotel at Miami Beach; Everglades Hotel at Miami; Biltmore Hotel at Coral Gables; Court House at Miami; Florida Power and Light Co.'s plant on causeway,—beacon; Arrow on Biscayne Bank Bldg. and rotating beacon; rotating beacon at municipal airport.

### MIAMI AIR MEET

**PILOTS** from every state in the nation, from Canada, Central and South American countries, the Bahamas and West Indies, have signified their intention of attending the three-day air meet and exposition in Miami, January 7-9. The Army, Navy and Marine air services will also be represented and will perform special maneuvers.

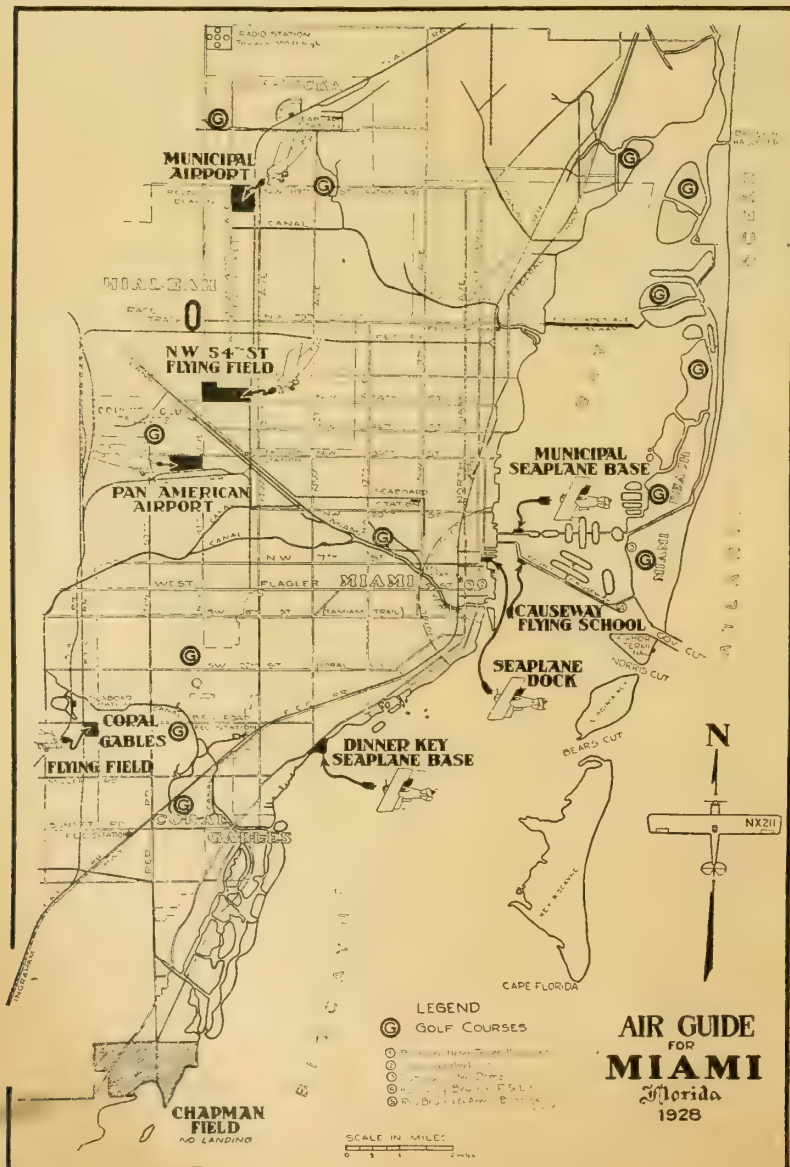
Walter W. Bruns, managing director of the derby, has forwarded invitations to every licensed pilot in North and South America, asking that they participate in a series of races, exhibitions and various events to commemorate municipal air developments at the 160-acre tract of land at Le Jeune and Gratigny Roads, given to Miami for use as an air port by Glenn H. Curtiss.

The long distance race to Miami has been dropped from the program, and the prize money originally intended for it will be added to the local races.

There will be 15-mile races each day for two and three-place ships powered with engines of 100 horsepower or less and 200 horsepower or less. In addition, the program calls for dead stick landing contests, parachute drops, bomb dropping contests, and night flying exhibitions. No charge will be assessed for entrance in the events or to exhibitors.

On January 9, the final day of the meet, Pan American Airways, Inc., will formally dedicate its new airport at Miami.

(Continued on next page)







## AT THE HUB of the Nation's Airways

*A*T the hub of the nation's airways—Los Angeles and New York only 24 hours distant by air travel—the vast Middle West, where flying hazards are least, now brought into the close union of a neighborhood—the airlines of North America radiate from their natural axis, *Kansas City*, just as the rail routes do. In the same length of time that it takes to serve 100,000 square miles by rail, one million square miles are now served by air transport. The same basic factors which made this railway growth and importance possible are true tenfold in making *Kansas City* what her location intended—the hub of the nation's airways!



### Not just a city but an empire

Kansas City advertising does not confine itself to corporate limits. Within the territory are raw materials and manufacturing advantages of a highly diversified nature . . . many within the city itself, many in the smaller cities of this rich area. Kansas City undertakes to tell the story of the *entire territory* to interested manufacturers, realizing that the city prospers only as its outlying territory prospers.

*Kansas City's municipal airport is the largest body of airport land in the country so closely adjacent to a metropolitan business section!*

Chamber of Commerce of

## KANSAS CITY

Kansas City, Mo.

Industrial Committee, Room 17  
Chamber of Commerce, Kansas City, Mo.

Please send me, without obligation, "The Book of Kansas City Facts."

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_



# You Furnish the Desire We'll Create the Opportunity

Aviation is the  
World's fastest  
growing industry.  
It moves at a rapid  
pace which de-  
mands restless  
energy...untiring  
effort...from every  
man in the field.

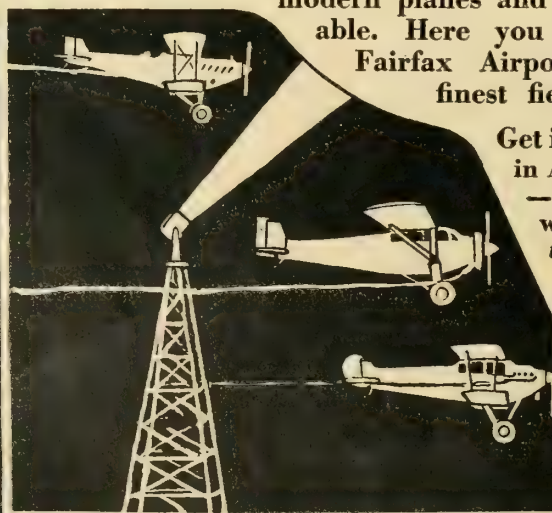
But in return it  
pays the greatest  
dividends of any indus-

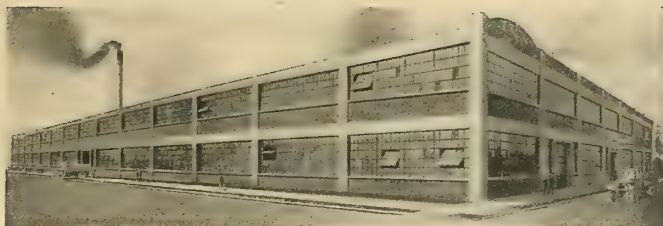
try on earth. You enter on the ground floor and the sky's the limit. If you have the energy and ambition, we can give you the only other requirement of success—competent, thorough personal training. This is the oldest school in the Middle West. We have trained hundreds of students without a single injury in flight instruction. And we have men everywhere making good. Porterfield students are successful because they receive careful flight and ground training from veteran instructors, using the finest and most

modern planes and equipment available. Here you learn to fly at Fairfax Airport, one of the finest fields in America.

Get into the game! Start  
in Aviation's biggest year  
—1929—to the success  
which awaits you! Mail  
the coupon today.

**PORTERFIELD**  
**Flying School, Inc.**  
Kansas City, Mo.





*The New Home of the Arrow Aircraft and Motors Corporation*

# THE ARROW SPORT

## SENSATION OF THE CHICAGO SHOW

**T**HE plane with a definite purpose in the field of aviation. The Arrow Sport is acclaimed by internationally known aviators as a real contribution to the airplane field. It combines easy maneuverability with excellent stability and yet provides very desirable anti-spin characteristics.

Stability—ease of handling—low initial cost—economical operation—all make the Arrow Sport the logical buy **FOR BUSINESS—FOR SPORT—FOR TRAINING.**

### SPECIFICATIONS

Take-off space .....100 ft.  
 Landing Space .....100 ft.  
 Top Speed .....108 m.p.h.  
 Landing Speed .....34 m.p.h.  
 Maximum Climb per minute .....1,000 ft.  
 Absolute Ceiling .....19,000 ft.  
 Service Ceiling .....16,000 ft.  
 Power Loading (60 h.p. motor) 20 lbs. per h.p.  
 Wing Loading .....6.75 lbs. per sq. ft.

Span Top Wing .....25 ft. 6 in.  
 Span Bottom Wing .....25 ft.  
 Wing area with ailerons .....178 sq. ft.  
 Length over all .....19 ft. 2 in.  
 Height .....6 ft. 11 in.  
 Span Tail Plane .....8 ft.  
 Weight Empty .....757 lbs.  
 Useful load .....443 lbs.  
 Full load .....1,200 lbs.  
 Power .....Le Blond

*Address sales department for descriptive literature*



**ARROW AIRCRAFT AND MOTORS CORPORATION**  
**HAVELOCK, NEBRASKA**

Desirable territory open for dealers and distributors.

Please give references when writing.



*(Miami Air Meet continued)*

This AIA airport, which is the northern terminal for the company, contains 120 acres. Its facilities include two large hangars, a passenger station, two paved runways (each 2,800 feet long), complete lighting equipment, etc.

It is probable that the second Keystone Patrician will be among the exhibits at Miami, if it is completed at that time. Other companies which will have exhibits are the Curtiss Flying Service, Inc., Pan American Airways, and Pitcairn Aviation, Inc.

**PROGRAM OF EVENTS****January 7**

9:30 a. m.—aerial parade over Miami.

10 to 10:30 a. m.—15-mile race for OX-5 or less, two or three-place ships. Prizes—first, \$200; second, \$150; third, \$100; fourth, \$50; and fifth, \$25.

10:30 to 11 a. m.—15-mile open cockpit, 200 h.p. class or less. Prizes—first, \$250; second, \$200; third, \$100; fourth, \$75; and fifth, \$50.

11 to 11:20 a. m.—exhibition of service pursuit planes. Prizes—trophies.

11:20 to 11:40 a. m.—15-mile race for observation planes. Prizes—trophies.

11:40 to noon—inspection of planes by visitors and selection of neatest appearing ship. Judges to be mayor and city commission. Prizes—first, \$75; second, \$50; and third, \$25 in gold.

1 to 1:30 p. m.—15-mile race for 200 h.p. or less, cabin planes. Prizes—first, \$250; second, \$200; third, \$100; fourth, \$75; and fifth, \$50.

1:30 to 2 p. m.—balloon bursting contest. Prizes—first, \$100; second, \$75; and third, \$50.

2 to 2:30 p. m.—bomb dropping. Prizes—first, \$100; second, \$75; and third, \$50.

2:30 to 3 p. m.—dead stick landing to a mark. Prizes—first, \$100; second, \$75; third, \$50; fourth, \$25; and fifth, \$15.

3 to 3:30 p. m.—Army and Navy race, 15 miles. Service planes, single seaters. Prizes—Liberty bonds and trophies.

3:30 to 4 p. m.—exhibition by service pursuit planes. Prizes—trophies.

4 to 4:30 p. m.—parachute drops. Prizes—first, \$75; second, \$50; and third, \$25.

4:30 p. m.—public inspection of planes and passenger carrying until dark.

8 p. m.—night flying by Pitcairn air mail pilots. Ships coming greatest distance, in event of a tie, prize to be divided evenly. Prize—\$500.

**January 8**—All events are to be repeated the second day, and the same prizes are to be given to winners.

The meet and exposition, which will include exhibits by manufacturers and distributors of aircraft is sponsored by the Greater Miami Airport Association and the Miami Aviation Board.

**NEW PAN AMERICAN AIRLINE SCHEDULES**

PAN American Airways, Inc., operating company for Aviation Corporation of the Americas, will begin operation on its line to Nassau and the West Indies on January 9. The new schedules will read as follows:

**Havana Air Limited**

Read down		Read up
8:00 a.m. Lv.	Miami	Ar. 1:30 p.m.
10:15 a.m. Ar.	Havana	Lv. 11:15 a.m.

**Havana Air Express**

9:15 a.m. Lv.	Miami	Ar. 5:15 p.m.
11:30 a.m. Ar.	Havana	Lv. 3:00 p.m.

*Continues to San Juan, Porto Rico, on Mondays, Wednesdays and Saturdays.*

12:15 p.m. Lv.	Havana	Ar. 1:15 p.m.
3:15 p.m. Ar.	Camaguey	Lv. 10:15 a.m.
3:45 p.m. Lv.	Camaguey	Ar. 9:45 a.m.
5:25 p.m. Ar.	Santiago	Lv. 8:00 a.m.

**Overnight Stop at Santiago**

7:00 a.m. Lv.	Santiago	Ar. 5:00 p.m.
10:00 a.m. Ar.	Port au Prince	Lv. 2:00 p.m.
10:30 a.m. Lv.	Port au Prince	Ar. 1:30 p.m.
12:30 p.m. Ar.	Santo Domingo	Lv. 11:30 a.m.
1:00 p.m. Lv.	Santo Domingo	Ar. 11:00 a.m.
4:00 p.m. Ar.	San Juan	Lv. 8:00 a.m.

**Miami-Nassau**

*Mondays, Wednesdays, Fridays*

9:10 a.m. Lv.	Miami	Ar. 5:00 p.m.
11:10 a.m. Ar.	Nassau	Lv. 3:00 p.m.

With this schedule arrangement, through connections may be made by rail to New York City, Boston, Chicago, St. Louis and other important cities. This air-rail hook-up makes possible a 37-hour trip from New York to Havana.

On the Miami-Havana-West Indies routes, a fleet of trimotored Fokker F-10s with Wasp engines is to be used. Each plane will carry 14 passengers and 3 men as crew. Sikorsky amphibians, each with 2 Wasp engines, will be used from Miami to Nassau.

**TENNESSEE AIR NEWS**

By JAMES S. LINDSEY

THE Interstate Airlines, Inc., opened its air mail and passenger route through Chattanooga on December 1st. George Meyers piloted the Fairchild plane "Miss Chattanooga" on the first trip north, while Eugene Fricks, former chief pilot of Marr Field, took the southbound mail. Marr Field is the Chattanooga base.

A SCHOOL was opened in Chattanooga on December 15th by the Interstate Lines to train its future pilots and crews. Two Fairchild monoplanes are to be used to train students.

**Nashville Notes**

By Virginia Matthews

AIR mail and passenger service through Nashville was inaugurated December 1 when the direct line from Chicago to Atlanta, with spur lines to St. Louis and Louisville, was established.

The company is operating two planes daily, one from either end of the route. Plans are being formulated to inaugurate night service by next spring.

McConnell Field, Nashville's municipal airport, is used.

The schedule is as follows: Southbound—leave Chicago 9 a. m., leave Champaign, Ill., 10:20 a. m., leave Terre Haute, Ind., 11:05 a. m. and arrive at Evansville 12:05 p. m. Leave St. Louis 10:30 a. m., arrive Evansville 12:05 p. m. Leave Evansville 12:20 p. m., leave Nashville 1:50 p. m., leave Chattanooga 3:15 p. m. and arrive Atlanta 4:30 p. m. Northbound—leave Atlanta 9:25 a. m., leave Chattanooga 10:30 a. m., leave Nashville 11:35 a. m., arrive Evansville 1 p. m., leave Evansville 1:10 p. m., arrive St. Louis 3 p. m. Leave Evansville 1:30 p. m., leave Champaign 2:55 p. m., arrive Chicago 4:30 p. m.



Pan American Airways international air mail and passenger routes.

# Feel the Thickness of this Paper

~ then imagine it  
split twelve times



THE paper on which this is printed is approximately three one-thousandths (.003) of an inch in thickness.

The mechanics of America are grinding in every-day practice within limits of accuracy of twenty-five hundred-thousandths (.00025) of an inch—that is just about one-twelfth the thickness of this paper.

Grinding means accuracy, and mechanical accuracy is essential for speed and dependability.

Grinding in recent years has revolutionized metal-working methods. Grinding Wheels and Grinding Machines are employed in all modern machine shops to obtain extreme accuracy, rapid production and low cost.

“Grinding” and “Norton” are synonymous. Norton precision-grinding machines have made possible fast production with precision. Norton abrasives trade-marked “Alundum” and “Crystolon”—in grinding wheels and as a polishing material—have secured a strong footing in practically every industry. Norton Refractories and Laboratory Ware are fast becoming factors in the power plant, foundry, laboratory, and in research work in general.

Norton Research Engineers, Chemical Engineers, Mechanical Engineers and Sales Engineers not only meet problems of today, but are studying into ways and means of bringing about greater accomplishment in the days to come.

NORTON COMPANY

WORCESTER, MASS.

# NORTON

Grinding Wheels  
Grinding Machines



Refractories-Floor  
and Stair Tiles



## LOUISIANA AIR NEWS

By HAROLD A. DEMPSEY

SECRETARY OF WAR DAVIS has approved a 20,000-acre tract four miles east of Shreveport, La., for the future home of the third attack wing of the Army Air Corps. Of the total acres, 3,000 will be used for quarters, airdrome and other buildings. The rest will be converted into a bombing and machine gun range. Work on the new post is expected to bring the total cost up to eight million dollars.

The approval of Secretary Davis was given on the recommendation of Assistant Secretary Davison and Major General James E. Fechet, both of whom indorsed the unanimous report of the special board which for almost a year made a study of sites offered by Columbus, Ga.; Montgomery Ala.; Shreveport, La.; Galveston, Houston, and Fort Worth, Texas.

NINE New Orleans business and professional men flew to Chicago for the International Aeronautical Exposition in a trimotored Ford plane. A stop for refueling was made at Memphis, Tenn. Those making the trip were Gilbert J. Fortier, R. E. E. DeMontluzin, W. F. Thurmond, F. W. Gavin, Walter Dufour, representing the city of New Orleans, L. L. Landon, Fred A. Blache, representing the Governor of Louisiana, John Woodville and I. B. Tribken.

RAPID AIR LINES, INC., has stationed one of its trimotored Ford planes at the Jefferson Parish Aerial Park a short distance from New Orleans. Twenty-five-mile tours over the city at a price of five dollars per passenger are being featured day and night. The plane was brought to New Orleans by Clyde W. Ice, pilot. With him were A. W. Spence of Omaha, Neb., manager of the Rapid Air Lines; J. C. Welling of Rapid City, chief mechanic; M. C. Enfield of Des Moines, Ia., advertising director; and R. K. Chubbuck of New York City, representing the National Aviation Club of America.

SLIDELL air field at Slidell, La., entertained its first guest recently, when Pilot Carl Hughes of New Orleans visited the field. To Bertram J. Morrill, the owner, he expressed his surprise at its splendid condition.

THE report of Wm. F. Centner, the airport specialist who was sent by the Aeronautics Branch of the Department of Commerce to New Orleans at the request of the Association of Commerce, states that the city has several sites available for an adequate type of airport. The report states further that the proposed site on Lake Pontchartrain, which is being reclaimed from otherwise shallow and waste lands of the lake, would offer facilities for extensive operations with maximum efficiency and safety. The distance is only five miles from the center of the city and quick access is

possible because of paved boulevards direct to the site.

The features of the Menefee private-commercial field were also enumerated in the report. The potentialities of Alvin Candler Field were pointed out in the report, but because of its distance and difficult access, this field was given third consideration. Abandonment is not considered advisable, because a city the size of New Orleans will need, as traffic increases, more than one available airport.

THE Seventh Annual Asphalt Paving Conference, held in New Orleans during the past month, took aviation into serious consideration. One of the principal speakers on the program was Colonel H. H. Blee, chief of the Airport Section of the Department of Commerce, whose subject was "The Airplane in American Commerce and Industry." Another prominent figure in airport construction who was on the program was A. H. Blanchard of Toledo, Ohio. Roads, landing strips and runways at airports, and the best methods evolved for their construction occupied most of the discussion.

THE National Association of Railroad and Utilities Commissioners, in convention at New Orleans, appointed a committee to consider the regulation of intrastate airlines. Lewis E. Gettle, Wisconsin, president of the association, was also authorized to appoint a committee to study requirements of the several states for aviation laws and to draft a uniform law governing air transportation to be submitted to the members for adoption. If the proposed uniform law is approved, members of the organization will attempt to have it enacted by the various legislatures of the several states.

THE American Flying Co., Inc., has been established at Shreveport, La.

## NORTH CAROLINA NEWS

By H. E. HUNTER

J. E. (ELLIE) WALTERS of Lumberton has purchased a new Eaglerock from the North State Aircraft Co., at Chapel Hill.

Ellie, who is one of the pioneer fliers of eastern Carolina and operator of Walters Airport, is engaged in a general commercial aviation business, including student instruction, passenger hopping and aerial taxi work.

HENRY CARTER, merchant and plantation owner of Maxton, is using a Waco-10 for business and pleasure. Mr. Carter has a splendid landing field on the northeast edge of town and is always glad to have any of the boys drop in.

FINLEY WILLIAMSON, JR., of Burlington, has started a flying service and has J. J. McIlhenny as chief pilot. Mr. Williamson has two OX-5 Travel Airs which he uses for hopping passengers.

## GEORGIA AIR NEWS

By AL MAJOR

ATLANTA'S rapidly growing importance as the hub of air mail service in the Southeast received a substantial boost recently, when two new routes were officially opened, furnishing daily service between Atlanta and Chicago and Atlanta and Miami. The opening of these two services, coupled with the present Atlanta-New York and Atlanta-New Orleans lines, gives this city double contact with the transcontinental air mail, another direct contact with Canada, and a new line with the Middle West, and Havana, Cuba.

Only day flying will be done on both lines until the necessary beacon lights and landing fields now under construction on the two routes can be completed.

Six new Mailwing planes will be placed on the Atlanta-Miami run, four in actual service and two for relief work. Jacksonville will be the junction or transfer point, with A. P. Kerr as division traffic manager. The two pilots on the Atlanta-Jacksonville route will be Ferman Stone and Tom Gurlin. The new pilots on the new Jacksonville-Miami route will be F. J. Schwaemmie and Fred Cann. The personnel of the Chicago-Atlanta route consists entirely of experienced transport pilots. These pilots will fly Wasp powered Fairchild monoplanes and will carry both mail and passengers, thus giving Atlanta its second regularly operating passenger service, there being passenger service already on the Atlanta-New Orleans route. Passenger service on the New York route will be begun by spring. Four trimotored all-metal Ford monoplanes for this service are now under construction. This service will extend from Atlanta to Greensboro, N. C., where it will connect with fast trains for Richmond, Washington and New York.

James G. Ray, Pitcairn general operations manager, announces that a feeder line from Jacksonville to Tampa will be started as soon as the lighting is completed on the Atlanta-Miami route.

WILLIAM B. HARTSFIELD, chairman of the aviation committee of the city council, recently recommended to the 1929 city council that it immediately appropriate \$340,000 for the field. \$100,000 of this money will be used for the purchase of the field, which is now on a rental basis; balance of the money is to be used for improvements.

CORDELE has recently completed work on an airport, which is to be known as Sheppard Field, and which is located just north of town. The new field embraces a large acreage immediately west of the present landing field, and has all conveniences.

THOMASVILLE has completed a modern airport, which will be known as McIntyre Field. The ground has been thoroughly drained and two runways of 2,500 feet have been constructed.

# AN OPEN LETTER to Ambitious Young Men

T. E. BRALEY, Chief Ground School  
O. P. HARRIS, Operations Manager  
JOHN FLOURNOY, Chief Flight Instructor

TED BRALEY, President  
J. E. ARDIS, Business Mgr.

FORREST LEATHERS, Field Master  
E. W. HARMON, Chief Mechanic  
WARD BRALEY, Chief Designer  
Engineer

FLYING FIELD  
MUNICIPAL AIRPORT  
TELEPHONE 8097

WICHITA, KANSAS

TELEPHONE MARKET 3475  
DOWN TOWN OFFICE  
314 YORK ST. 15TH FLOOR

## BRALEY SCHOOL OF FLYING

U. R. Ambitious,  
Home City, U.S.A.

My Dear Sir:

Do you know why Wichita is called "The Air Capital"? There is a reason.

It is because here are seven aircraft factories humming with industry, manufacturing 60% of all the airplanes used in America today.

Do you know why the Braley School of Flying is the outstanding institution of its kind in the great Southwest? There is a reason for this, too.


It is because we are pioneers in aviation, and are the first Flying School in the world to help build and establish Wichita as "The Air Capital."

Do you know that in Wichita we have ideal flying weather the year round? Do you know we teach you to fly in new ships, safe and speedy? Do you know that we teach you to design, build and repair all makes of aircraft? And will get you a job when you receive your diploma?

Send me the Coupon and we will promptly give you information and full details of training and terms.

Yours truly,  
*Ted Braley*  
President.  
The BRALEY SCHOOL OF FLYING, Inc.

P.S. Do you know that over 20000 pilots will be needed in the next 24 months.



**TED BRALEY**

Pilot, Engineer, Designer, Instructor, is recognized as one of the foremost Aviators in the country; Pioneer and Leader in the Advancement of Aviation; Associate of Laird, Beech, Cessna, Stearman and Goebel; Owner and President of The Braley School of Flying which is a member of the National Aeronautical Chamber of Commerce.



**COUPON**

TED BRALEY, Wichita, Kansas.

I saw your Open Letter in Aero Digest Magazine and want further information about learning to fly in Wichita, "The Air Capital."

Name .....

Address .....

City and State .....



## DALLAS AIR NEWS

By CAPT. W. H. SCOTT

THE tri-city rivalry for air supremacy in the South has developed into a race between Dallas, Fort Worth and San Antonio, with each city struggling hard to raise capital to build airplane plants, airplane service stations, repair shops, and depots for aviation supplies. At the moment, Dallas holds the lead through the formation of a local company with \$100,000 capital to be called the Dallas Aviation School, with Capt. W. F. Long acting as president of the company. This company will use its large present resources for an overhauling plant. It is the largest school in the South, having over 50 students taking instruction. Allied with the Dallas Aviation School will be the Dallas Aviation Industries, Inc. This branch of the firm will deal exclusively with the sale of airplanes.

The formation of the Dallas Aviation School as a separate unit followed the announcement that the Southern Airways of Dallas and San Antonio would confine its activities to San Antonio alone. This company will reorganize with a capital of \$250,000. Judge Winship, president, announced that his company will devote its activities to building a new type of plane that will be announced in the spring.

SPONSORED by the Dallas Flying Club, every aviation club in Texas invited members of the state legislature to a special luncheon on November 30, for the purpose

of discussing state regulations to control flying conforming with the Department of Commerce air laws.

For months, a committee from the Dallas Flying Club headed by Capt. Harry Barnhart has been drawing up the act which will be submitted to the next session of the Texas state legislature which opens in January. Those prominent in the movement are Lieuts. Byron Good, Arthur J. Reinhart, Dallas city commissioner, Howard Woodal and Garza Wooten; Capts. W. F. Long and J. L. Freeze, secretary; Col. Bill Cole, Lloyd Long, Texas manager of Fairchild Air Survey; C. B. Braun, Texas manager N. A. T.; E. R. Schoen, and many others.

ACTIVITIES of the Aviation Cadets of America have assumed national importance. New squadrons are being formed in Muskogee, Okla.; Omaha, Nebr.; Los Angeles, and many other cities, while new Texas squadrons are being located at Denison, Waxahachie, Fort Worth Y. M. C. A., Sherman and Durant.

THE 77th Observation Squadron of Fort Worth and the 366th Observation Squadron stationed at Love Field, Dallas, will combine activities and do joint training.

A year 'round training school for reserve fliers was recently ordered for Dallas, and air training at the new field at Grand Prairie will commence the early part of the year. Improvements are now being made under the direction of Lieutenant Weddington, who has been appointed field manager.

A CHARTER of what is believed to be the first company in the country incorporated for the sole purpose of insuring airplane passengers who pay fares was approved by the Texas attorney general's department early in December. Three Dallas men are heading the company, which is called the Air Travelers Air Insurance Company of Dallas,—Tom E. Campbell, George Grogan and A. H. Peterson. The policy restricts payment on policies to those persons who are fare paying passengers, riding within the regularly designated compartment of the plane for passengers.

## TEXAS AIR NEWS

A NEW Ideco hangar was recently erected on the airport at Brownsville. Measuring 80 x 100 x 18 feet in size, this hangar is of galvanized steel frame and Armco iron sheeting and is thus protected against rust and corrosion. The hangar is one of the many different types manufactured by the International Derrick and Equipment Co., of Columbus, Ohio and Los Angeles, California.

GREENVILLE'S airport will occupy a tract of at least 353 acres, 4.4 miles from the center of town. For the present, the city has leased this land with an option to purchase. The field is naturally drained and supports a thick growth of grass. This site was advised and approved by W. J. McKenzie of the Aeronautics Branch of the Department of Commerce.

"PROMISES FULFILLED"



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Where U. S. Government Trained Instructors, with new and up-to-date equipment, will give you a new idea of what an Aeronautical Training School can accomplish for you!

Where you can enjoy and utilize the countless advantages to be found in the world's great Metropolis. New York is rapidly becoming the center of Aeronautical research and industry! The Opportunity is there! Why not grasp it?

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# LARGEST FLYING SCHOOL IN THE SOUTH—WHERE LEARNING TO FLY IS EASY

*"Where the Summer Spends the Winter"*



DALLAS AVIATION SCHOOL, INC., DALLAS, TEXAS

## SAVE 1/3 TO 1/2 ON YOUR COURSE

We claim that a student can learn to fly in less time here than elsewhere, as every day is flying day. This means a big saving. Students can live on the field very reasonably, which saves our students money on living expenses. We have bus service to the city 18 hours a day, 10 cents fare. Our prices for pilot courses are based on all year flying and are less than is usually charged.

## Our President, CAPT. LONG, says:

"I want to teach you to fly. I will personally see that you learn the right way. I have been flying for the past ten years, most of which time has been spent in training students, and I know how it should be done. You can depend on me and can count on having everything in your favor here."

W. F. LONG, Pres.  
Capt. U.S.A.C.R.

# OUR FLYING FIELD — LOVE FIELD

*Selected by U. S. Gov't for training World War fliers. None better in the country.*

### OUR PRESIDENT

and all instructors are U. S. Gov't transport licensed pilots and each student is personally trained by them.

### CLASS ROOM INSTRUCTION

From text books on motors, ignition, building and repairing airplanes, aerial navigation and meteorology.

### EVERY DAY IS A FLYING DAY HERE

No loss of time on account of snow, sleet, blizzards or zero weather. An ideal section in which to learn to fly.

### OUR GRADUATE PILOTS

Are rated high and are piloting ships or managing airports all over the nation.

### STUDENTS HERE FROM 35 STATES

They are taking training now. In the past few months we have had some from Canada, China and Mexico.

### TEN YEARS SAFE AND SANE FLYING

And not a single fatality. We take no chances and we require no bond from students. We follow U. S. Gov't rules in all flying and instruction.

You can enroll any time. Instruction starts upon arrival.

Write or wire for our catalog and further information.

### OUR PRICES

Home study course, 10 lessons by mail. Credited on any course taken later, \$15. Primary course, 10 air hours and ground work, \$150.

Advanced course, 15 air hours, ground work, cross country flight, \$250.

Commercial course, 50 air hours, ground course, everything in flying, \$750.

Transport course, 200 air hours, fits pilots for transport license, \$1,500. After Feb. 1st price will be \$2,000.

Ground course, 3 months' training in mechanics, building and repairing planes and motors. Free with all courses except primary, \$100.

800 new airports are being opened. New airplanes by the thousands are being built. More pilots are needed.

Dallas has a population of 300,000. And it is a metropolitan city in every respect. \$500,000 is now invested in airports by the city. The people here are "Air Minded" and will heartily welcome you. Come to Dallas and learn to fly.

### TO PROSPECTIVE STUDENTS:

### BIG SPECIAL OFFER

For the month of  
January only

WE WILL PAY YOUR RAILROAD FARE FROM ANY POINT IN THE UNITED STATES TO DALLAS.

Enroll for either a Commercial or Transport Course and your R.R. fare will be credited on the price of your course.

If you drive your car through we will make the same offer and refund the amount of R.R. fare from your home.

Save time and your dollars and come to Texas where it is easy to learn to fly.

Write or wire us for reservation at once.

# DALLAS AVIATION SCHOOL, INC., LOVE FIELD, DALLAS, TEXAS

We are affiliated with Dallas Aviation Industries, Inc., wholesale airplanes and supplies.

REFERENCES: Mercantile National Bank, Dallas Chamber of Commerce.

DISTRIBUTORS of Swallow, Lincoln Page and Curtiss airplanes.



## WISCONSIN AIR NEWS

By WILLIAM SCOLLARD

**A**N act regulating aviation and providing for a standard of qualifications for aircraft pilots, and conforming with the Department of Commerce air laws, will be introduced by Senator Oscar H. Morris in the next session of the state legislature.

**T**HE Brown County Airport has been incorporated at Green Bay with a capital of \$6,000, for the purpose of maintaining and operating an airport for the new Fox River Valley air mail route through that city. Signers of the articles of incorporation are F. H. Bogda, James Stathas and Milton F. Smith.

Plans are being made for the erection of beacon lights along the Fox River Valley route, operated by the Northwest Airways, Inc. Beacons will be located about 10 miles apart from Milwaukee to Green Bay, and an emergency landing field will be established midway between Fond du Lac and Milwaukee.

**T**HE new Fairchild cabin monoplane of the Parker Pen Company of Janesville was recently christened the *Parker Duofold* by Miss Amelia Earhart, the first woman to fly across the Atlantic. The plane is to be used for making rush deliveries and for the fast transportation of Parker officials. To conform to the color scheme of the Duofold Pen, the plane is painted red with wing tips black.

**T**HE Grandview Aviation Co. has been incorporated at La Crosse with a capital of \$16,000. The new company deals in airplanes and conducts an aviation school. The incorporators are W. A. Henke, L. J. Brody and R. L. Eagan.

**L.** A. HOFFMAN, operator of the Head of the Lakes Airways, has taken a five-year lease on the municipal airport at Superior. Plans are under way for the formation of a \$50,000 corporation to operate the field. The plans also include the erection of a new steel hangar and operation of a flying school with B. A. Wright, of Chicago, as chief pilot and instructor.

**B**RANCH organizations of the Wisconsin Civic Air Service have been formed at Appleton, Green Bay, Marinette and Fond du Lac by Miss Lydia Kaleshek, woman aviator.

**A** SPUR line from Milwaukee through Fond du Lac, Oshkosh and Appleton, to Green Bay was added to C.A.M. 9 (Chicago-Minneapolis air mail route) on December 15. The plane leaves Milwaukee at 7:30 a.m. and arrives at Green Bay at 9:00 a.m. Leaving Green Bay at 3:45 p.m., it arrives in Milwaukee at 5:10 p.m.

**A** CAMPAIGN to foster aviation education in the public schools and awaken greater interest in flying is being conducted by the recently organized Racine Aviation Club, of which Frank H. Lovell is president.

## OKLAHOMA AIR NEWS

By ERNEST W. FAIR

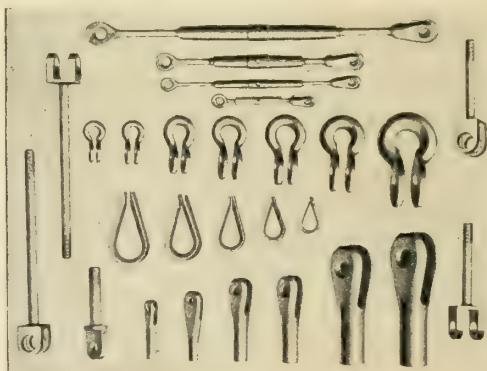
**T**HE Coffman Monoplanes, Inc., has completed its factory opposite the Oklahoma City municipal airport and has begun production. Sam H. Coffman, Fred Durland and D. A. Todd are the incorporators.

**T**HE factory of the Red Bird Aircraft Co. at Oklahoma City has been closed and the firm disbanded.

**TAU OMEGA**, aeronautical fraternity at the University of Oklahoma, has secured a clubhouse for the use of the fraternity members at Norman, where the mother chapter is established. Members of the club have secured a flying instructor.

**T**HE Okay Airplane Company has purchased a plant formerly owned by the Okay Truck Company at Okay, which is in Wagoner County near Muskogee, where they will manufacture planes. Wichita, Kansas, men are backing the firm. Dan L. Jones is secretary-treasurer.

**A** SITE northeast of Oklahoma City between Tenth and Twenty-third streets, east of the Grand Boulevard, has been recommended by W. J. Mackenzie of the Department of Commerce for Oklahoma City's new air field. A site west of the present field was given second recommendation, and the present site, third.



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**STANDARD TYPE TURNBUCKLES**

Airplane parts of merit

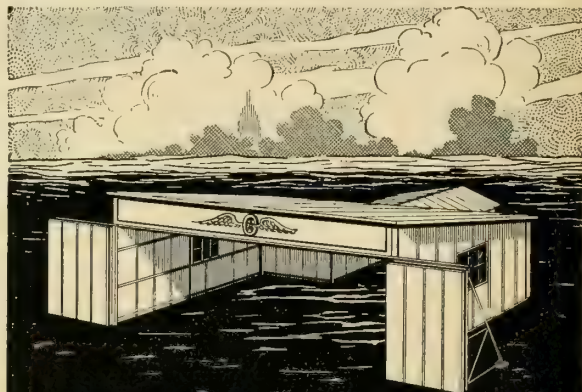
**SHACKLES, TURNBUCKLES, CLEVIS ENDS  
CLEVIS PINS, AIRCRAFT BOLTS**

(milled from bar)

*Direct Contractors to United States  
Army and Navy and many  
airplane manufacturers*

**STANDARD AUTOMATIC PRODUCTS CO.**

**Corry, Pennsylvania**



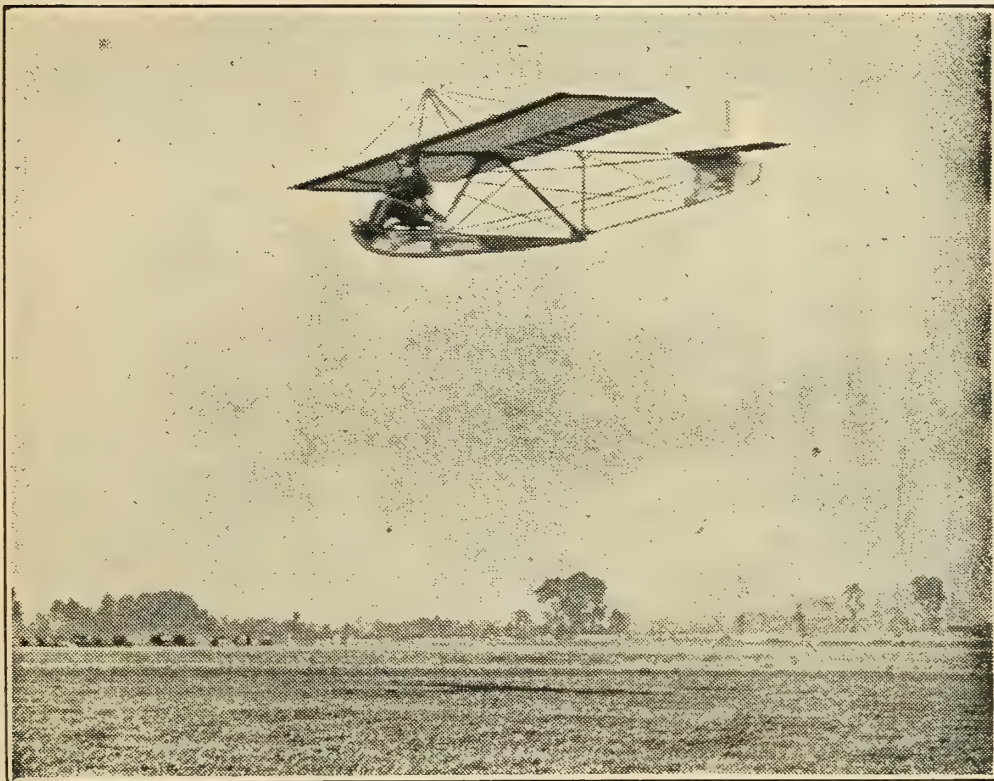
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**FIRE PROOF LIGHTNING PROOF  
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STEEL BUILDINGS FOR EVERY PURPOSE**

**THE EDWARDS MANUFACTURING CO.**

345-395 Eggleston Avenue, Cincinnati, Ohio

**Photograph of glider in flight at Minneapolis, Minnesota,  
Sept. 17th, 1928**



*The* blue prints in book form including drawings of the simple fittings needed, complete details of all plane parts and a written set of specifications are available at \$3.00 per set.

Glider will be popular for many reasons. First, they are cheap to build, costing around \$125.00; second, men can learn a great deal about flying from glider instruction; third, they can be flown at fifteen miles per hour and can be towed behind automobiles for short distances; in fact, they can even be towed behind aeroplanes, as has been done in Germany. Read the attached special offer.

**Flying Suits**—A double zipper body, with zipper legs, belted full length suit, winter type fur collar, fleece wool lined, strap arms, famous Aerotogs make, regular \$35.00 value —\$24.50 by express. Send \$5.00, we will

mail you the suit for fitting. If not satisfactory return without obligation. If satisfactory pay postman. Special price to flying clubs.

*Write for new lists on engines,  
goggles, flying suits, helmets,  
planes and motor parts.*

Marvin A. Northrop,  
730 Washington, Ave., North,  
Minneapolis, Minnesota.  
Attached find \$3.00. Mail me your complete set of  
plans and prints of German glider pictured above. I  
will return these prints to you for refund, if not satis-  
factory, after two days inspection.

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## DETROIT AIR NEWS

By FRANK BOGART

**PURCHASE** of a plant site on the new mile square Detroit-Wayne Industrial Airport by the Stinson Aircraft Corporation was the outstanding event of the month.

The new industrial port at Wayne is a private enterprise, formed quietly and without any stock sale by business leaders who have for several years past been investing in aviation enterprises, both local and otherwise. These men have despaired of obtaining any action toward airport development from either city or county officials which would permit this city to offer facilities that would attract other concerns in the industry to locate here. Both the city's municipal landing field and the county's so-called industrial mile square tract remain in chaotic state at present, the limits of the former being undetermined, while the latter has not yet been actually acquired, although bonds to pay for it have been authorized.

**STOUT** Air Services, Inc., has become Detroit agent for Capitol Airways of Indianapolis but is in no way identified with the operating side of this company. Daily service has been begun between Detroit and Indianapolis, with a stop at Fort Wayne. Ryan Broughams are standard equipment. The fare is \$33 each way, and three hours and 15 minutes are required for the trip.

**WINGS, INC.**, recently formed by William B. Stout and associates to merchandise airplanes, act as agents for airplane accessories, and conduct a thorough-going and up-to-date school of flying, announced December 15 that it has entered into a contract with the Curtiss Flying Service, Inc., of New York, to take over the sales and school divisions. C. V. Burnett leaves Wings, Inc., to become vice president and general manager of the Curtiss-Detroit Corporation, which has leased a part of the Aircraft Development Corporation's airport on Grosse Ile. The Curtiss school here will be one of the first three out of 25 schools which the Curtiss interests plan to locate in all parts of the country.

**GAYLORD W. NORTON**, a real estate dealer, who owns two airplanes and is now taking instruction to qualify for a Federal pilot's license, is the president for 1929 of the Detroit Flying Club. The club has 400 members, 50 of whom are active pilots, and is about to launch a drive for 1,000 members among the newly-fledged flying students. Norton hopes to add sufficient strength to the club, both financially and in membership, so that the long contemplated plan of club ownership of airplanes may be carried out.

**THE** city has definitely granted to the air squadron of the Thirty-Second Division, Michigan National Guard, the right to occupy the new 18-plane hangar now being erected on the municipal airport at Lynch and French roads. Six new planes have been allotted the squadron by the War Department, as a result of this permission,

Major Floyd Evans, in command, has announced.

**THE** city council has been advised that it can spend part of the \$5,000,000 bonds, voted in November for improving and enlarging the airport, on construction of a hangar, 3000 by 100 feet, to be used once a year as the site of a national aircraft show, such as the second annual All-American Aircraft Show which will be staged April 6 to 14. If decision to proceed with this structure is reached by mid-January, it is understood that the building will be ready for the April show, which otherwise will be held in Convention Hall, scene of the first show last year. It has 166,000 square feet.

**EDWARD F. SCHLEE** and William S. Brock announced December 12 that they have become middle western distributors for the Lockheed Aircraft Corporation of Burbank, Cal. Benjamin S. Hunter of Los Angeles, counsel for Lockheed, came here to close the deal with the world fliers, and announced that Detroit is being considered for the site of an assembly plant. Schlee and Brock denied the statements that they had become majority stockholders in the Bellanca corporation, Wilmington, Del., or that they would be national sales agents for that plane.

**GLIDERS, INC.**, of which William J. Scripps is president, has built and tested its first engine-less machine. The Evans Glider Clubs of America, sponsored by Edward S. Evans, millionaire sportsman and aviation enthusiast, announce the formation of three more clubs in the Detroit area and several others in the Pacific Northwest.

**THE** Detroit area is supporting 13 flying schools, a survey shows. The managements of these schools claim a total of more than 1,000 students under instruction, but the records of the Department of Commerce show that permits have been issued to only 486 students. The state department of vocational education is to commence an inquiry into the situation, because it is claimed

in many quarters that the schools may teach people to fly but do not make even the slightest attempt to give a pupil instruction of a nature sufficiently thorough to permit him to go into the commercial aviation field to make a living. Many of the schools advertise that their courses will do this for the student.

### New Stinson Factory

**THE** Stinson Aircraft Corporation will soon begin construction on a new and larger factory building, which is to be located at the Detroit-Wayne Industrial Airport. The constantly increasing production of Stinson planes has made this step necessary. The new factory will be a one-story structure with approximately 85,000 square feet of floor space. The latest and most efficient features in factory architecture will be incorporated in the building.

The new Detroit-Wayne Industrial Airport, where the Stinson factory will be built, is intended as a location for commercial and industrial aircraft operations. Its use will be regulated according to the needs of the companies which locate there. The tract covers an area of 640 acres, of which 280 acres will be used as a flying field. Runways from 3,500 feet to 4,800 feet in length, and extending in all directions, will be laid out. This airport is situated about one mile from the center of Wayne.

**THE** manufacturing process of the new light alloy called Bohnalite, which was developed by Chas. B. Bohn, president of the Bohn Aluminum and Brass Corporation of Detroit, is interestingly and fully described in a booklet which this company has just issued. Most of the various Bohnalite products are also shown, ranging from eleven-foot dirigible cranks to small bearing caps. A wide variety of industries are now using Bohnalite which, the makers claim, is 62 per cent lighter than iron, yet possesses all the advantages of the heavier metal.

Briefly, the advantages of Bohnalite are high and uniform hardness, great density, fine grained structure, extreme lightness, exceptional strength and ductility.

Automobile and airplane executives have recognized the advantages of this lighter metal, and as a consequence, the Bohn organization is supplying a large volume to these industries. In recent years a large number of other manufacturers have adopted Bohnalite, so that today makers of radios, cash registers, marine motors, vacuum cleaners, ironers, typewriters, etc., are using Bohnalite.

This new Bohnalite booklet contains not only general descriptive data, but specific information covering the physical properties of each Bohnalite process.

**ELEVEN** seniors who are studying aeronautical engineering at the University of Detroit recently made an inspection trip through Ohio. Their itinerary included Wright Field at Dayton, the factory of the Advance Aircraft Corp. at Troy, and the

(Continued on next page)



Charles B. Bohn

# When You Step into the Cockpit to Solo



## What will guide you — Luck or Good Training?

A young man goes through the routine of his primary training. With his instructor he banks and turns, he climbs and dives. He makes landings and take-offs and learns the "feel of the plane."

Finally after permission from his instructor he is ready to solo. As he nervously steps into the cockpit calling "Contact," what do you think will help him most? Luck? He needs a far safer assurance than that.

Suppose luck guides him through his first solo. After that, will it keep guiding him?

Just a few hours training in a privately owned plane will

not make a flyer. A real pilot needs thorough training in every branch of aeronautics. He must know aerodynamics to know why his plane obeys different controls and to know how his plane reacts under different conditions.

He must know of the stresses imposed on his plane in different maneuvers—he must know plane mechanics and the construction and design of his plane.

He has to have a thorough aeronautical training back of his flying experience. Aeronautics is a science now and must be taught as such.

### You Must Have Thorough Training! Get It At the College of the Air!

In addition to offering you thorough training in one of the finest flying courses in America, Marshall Flying School offers you a complete technical training in every branch of aeronautics.

Construction, repair and maintenance of all types of aircraft; aerodynamics, aviation, meteorology, theory of flight—instruction indispensable in the making of a successful pilot.

The College of the Air makes a real honest effort to train young men for successful work in the aeronautical industry. It trains them thoroughly for the big things ahead.

If you are interested in securing complete, yet inexpensive training to fit yourself for success, write for our new free catalog which will show you the big things ahead of you.



### Monoplane Instruction at no Increase in Tuition

Flying instruction will be available on the new highly efficient all-metal structured monoplane, recently designed by Walter H. Barling, internationally famous aeronautical engineer.

This monoplane is a very recent development and the design and construction is founded on newer and sounder aerodynamic principles. It is ideal for student training. Monoplane instruction will be in addition to training on four other types of planes—and at no additional cost.



## MARSHALL FLYING SCHOOL, Inc.

MARSHALL FLYING SCHOOL, INC.,  
150 English Street, Marshall, Missouri.

Gentlemen:

Please send me your latest flying school catalog which fully describes your flying courses. I understand this will place me under no obligation.

Name .....

Address .....



(Detroit Air News continued)

Hartzell Propeller Works at Piqua. Prof. Peter Altman, head of the aeronautical engineering department at the university, was in charge of the trip.

**A** NEW company, called Showalter-Associates, has been organized in Detroit. The activities of this company include airport surveying, drainage, landscaping, design of buildings, lighting, etc.

Capt. Floyd Showalter, former Army Air Corps flier, is head of the company. His associates are: Ralph F. Pinner and Raymond H. Wilcox, landscape engineers; J. Ivan Dise, architect; and John H. Schumann, electrical engineer.

**T**HE Stinson School of Aviation, which was organized in Detroit in December, 1927, has been a growing enterprise since its inception. The original enrollment of six students has increased to 400, and equipment has been added concomitant with this expansion. The most recent step in the growth of the Stinson School was the establishment of branch schools at Cleveland, Toledo, St. Paul and Chicago.

**T**HE Detroit Flying Club is to establish new downtown headquarters, in charge of an executive secretary. Information concerning air taxi services, flying schools, condition of airports, etc., will be available, and airway maps will be kept on file.

**T**HE Detroit Steel Products Company has issued a treatise on how the lighting and ventilating requirements of a proposed building may be analyzed in advance of construction. This treatise sets forth the results of five years' research and experiment by the company's research engineers and professors of engineering at the University of Michigan. Copies may be obtained without charge from the Detroit Steel Products Company.

## MICHIGAN AIR NEWS

**A**T the time of the inauguration of air mail service in Flint during December, the AC Spark Plug Company sent every letter possible by air. Over twenty thousand letters were dispatched by the company. Fred A. Jones, a pilot for Thompson Aeronautical Corp., flew the first mail from Flint.

### Associated Commercial Airmen of Michigan

**S**IX flying fields recently united in the formation of the Associated Commercial Airmen of Michigan. The purposes of this association are: to promote public confidence in aviation, to curb disastrous price cutting on aerial passenger flights, taxi service, flying instruction, etc., and to carry on an associated advertising campaign.

The flying concerns represented are: Triangle Flying Service, Pontiac Air Taxi, Aero Corporation of Detroit, Burns Flying Field, Packard Field, and Maycock Flyers. Guy Burns is president of the association; Ivan C. Kay, vice president; and Alice Gorham, secretary-treasurer.

**K.** K. McGARVEY has been appointed to the equipment sales engineering staff of the AC Spark Plug Company at Flint. Mr. McGarvey has been secretary of the AC engineering department for the past three years.

**T**HE Capital Aircraft Corporation of Lansing has announced a new monoplane powered with a LeBlond Sixty engine, the Air Trainer. This plane, which is designed for training purposes, is of the parasol type. It has a landing speed of 35 miles per hour and a high speed of 100 miles per hour. Its cruising radius is 400 miles. On its first test flight, the plane was flown hands off for twenty minutes.

Joseph Thomas is president of Capital Aircraft Corp.; D. D. Thomas, vice president; Harry Hittle, secretary; and F. O. Raynor, treasurer.

**J**OHAN T. OWEN and Dr. R. R. Rosenbaum, research chemists and engineers, have developed a method for removing the gummy constituents and aldehydes from vegetable castor oils. This method is called the Jorr Process. The Air-Way Oil Co. of Detroit is the licensee of the Jorr Process.

**T**HE McCarthy Aircraft Company, formerly of Grand Rapids, is now located in Portland. The company is now developing a new single-seater, sport monoplane. George L. McCarthy, president and general manager, has been active in aviation for more than 12 years.

**F**LINT and Pontiac were added, on November 27, to C. A. M. 27, the air mail line operated by Thompson Aeronautical Corp. Several thousand persons witnessed the take-off of the first plane at each city. Bishop Airport, used by the airline at Flint, which will be completely developed soon, is five miles southwest of Flint and contains 220 acres. Pontiac Municipal Airport, the Pontiac terminal, is six miles from the city. A hangar has been erected and lights are now being installed at the latter field.

**T**HE Thompson Aeronautical Corp. recently installed two tower beacons on its Chicago-Bay City mail route. One is 2½ miles west of Charlotte, on the route between Lansing and Kalamazoo; the other is at Shelbyville, between Grand Rapids and Kalamazoo.

**C**ITY and county officials at Muskegon are contemplating the use as an airport of a level tract of land five miles south of the city. This will replace the Continental Airport which is closely surrounded by oil wells.

**A** NEW airport is to be developed at Cadillac. For this purpose, a 165-acre tract north and west of the city was the gift of W. L. Saunders. Runways, 500 feet wide and ranging in length from 2500 to 3800 feet, will be laid out in four directions. The soil on the field is sandy and naturally drained.

## ANN ARBOR NOTES

By ROLLIN FAIRBANKS

**I**N an attempted non-stop flight to Havana, Cuba, from Walkerville, Ontario, Lieut. Leonard S. Flo was forced down at Key West due to illness caused by taking too many caffeine tablets. He used a Spartan biplane with a special installation of fuel tanks having a total capacity of 225 gallons, and equipped with an earth inductor compass. Lieut. Flo is president of the Flo Flying Services, Inc., and manager of the local airport.

**H**HEATING equipment has recently been installed in hangar number one at the municipal airport, and flight instruction will be continued throughout the winter at the Flo Flying School.

**T**HE Triangle Flying Service, operating on the Detroit road, now has the agencies for four airplanes,—the Monocoupe, Ryan, Waco and Driggs Dart. Besides the three partners, George Tabraham, Ivan Kay, and Charles E. Adams, the personnel includes Captain Adrian Reeves and G. O. Black.

## PEORIA AIR NEWS

By LIEUT. WM. F. RITTER

**E**ARLY in the year the automobile dealers are planning an aircraft show in conjunction with the Annual Auto Show.

**T**HE Peoria Association of Commerce has recently acquired an option on a desirable tract of land consisting of 160 acres, one half mile from the city.

**P**EORIA'S other airport, Lufbery, has experienced decreased activity because of the dissolved partnership of John R. Lewis and LeRoy Murphy. The Peoria Aero Club is the only organization operating from this airport at present.

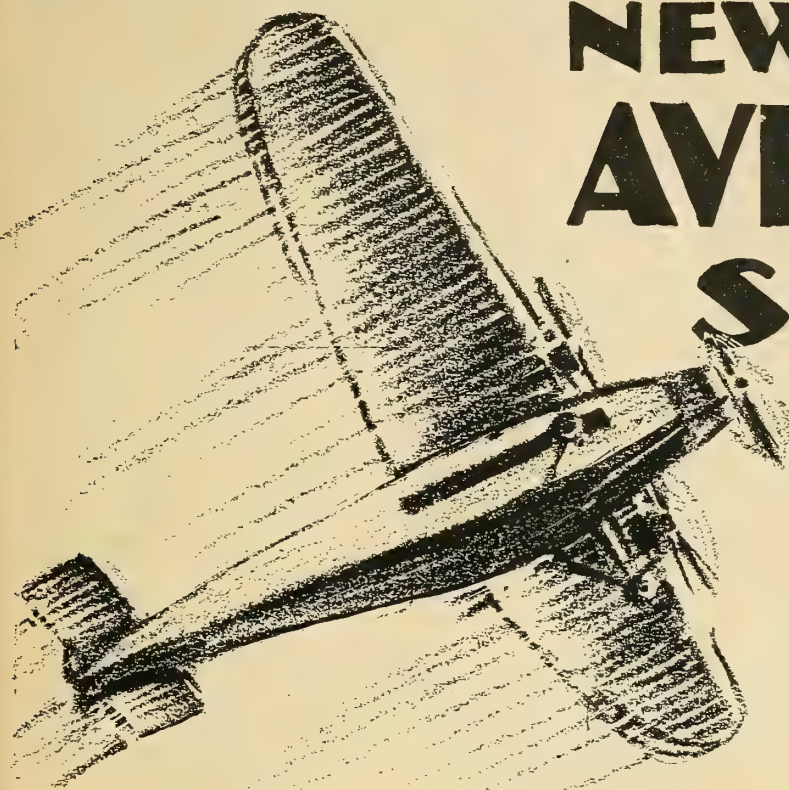
**C**OLE AIRCRAFT, INC., representative for Alexander Eaglerock, is planning an expansion program.

**T**ONY AMREIN, vice president of the Varney School of Flight, an establishment of nine years standing in Peoria, has announced a change in the management of that organization. Alexander Varney has disposed of his holdings to Mr. Amrein, who will continue the management of the municipal airport and conduct a school of instruction. Mr. Varney plans to go to South America as the representative of a large American aircraft manufacturer.

**T**HE National Airways System, of Lomax, Ill., manufacturer of the Air King and the Monofour, which is moving to Peoria, broke ground for the factory and airport here on December 5. Mr. Tannus, president of the N.A.S., states that they plan to turn out five planes a day. It is also stated they intend to produce their own motors.

WHERE YOU WILL BE PROUD TO DISPLAY YOUR PRODUCT

# NEW YORK AVIATION SHOW



In the very heart of  
the World's Greatest  
Aeronautical Market

## FEBRUARY 6<sup>TH</sup>-13<sup>TH</sup>

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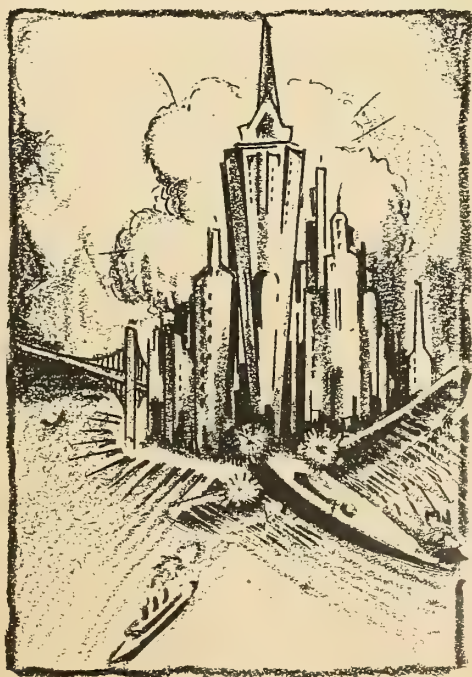
ENTERTAINING

# GRAND CENTRAL PALACE

Held under the auspices of

AVIATOR'S POST NO. 743, AMERICAN LEGION

In cooperation with the leading civic and educational organizations.



Say you saw it in AERO DIGEST



## INDIANA AIR NEWS

By H. GENE HAYNES

**I**NDIANAPOLIS' air-minded mayor, L. Ert Slack, has recommended the purchase of a municipal airport. The site selected by the mayor, however, is not the one proposed by the citizens' committee of the chamber of commerce. This committee selected a site, comprising 920 acres at about \$421 an acre, seven miles west from Monument Circle, on the old National road.

The mayor selected a site comprising 1,000 acres, just a few hundred feet from the site selected by the committee, at an average of \$292 per acre.

The council is ready to take action on the first bond issue of \$675,000, the minimum amount that can be expended by a municipal airport under existing statutes. This will provide about \$400,000 for buildings, runways, etc.

**A** PLANT for development and manufacture of airplane engines will be opened in Indianapolis soon, according to plans announced by G. M. Williams, president of the Marmon Motor Car Company, who was as one time general manager of the Dayton-Wright Company, Dayton, O.

Colonel Williams gained recognition in the World War, when, as a member of the engineering staff of the War Department, he assisted in the development of the Liberty engine. The Marmon company, then known as the Nordyke & Marmon, received a pennant from the Government for exceeding its production quota of Liberty motors. The

company also produced Hall-Scott airplane motors.

The company, which plans to develop and manufacture airplane engines on a large scale and later to produce airplanes, will include Williams and his associates and will be headed by H. H. Brooks, who has been general sales manager for the Marmon outfit for several years. Howard Marmon, vice president of the Marmon factory, will direct the engineering activities of the airplane company. Colonel Marmon will retain his position with the automobile factory. The new company will have no connection with the Marmon Motor Car Company.

**U**NDER an order adopted by the Indianapolis board of park commissioners, no airplane hangars or landing fields can be located within 500 feet of a boulevard.

**T**HE Curtiss Flying Service, Inc., of New York, is establishing a subsidiary in Indianapolis. Capt. H. Weir Cook, regular army instructor, will head the concern. Cook has resigned from the army, and plans to open headquarters in the proposed municipal flying field when completed.

**C**ONSTRUCTION will soon begin on the new airport at Evansville. A \$190,000 bond issue has been authorized for this purpose. A terminal building and a hangar, 80 x 100 feet, will be constructed and lighting equipment installed at the airport, which is six miles from the center of the city of Evansville.

**T**HE Chevrolet Aviation Motors Corporation has been organized in Indianapolis for the purpose of manufacturing airplane engines. The company is an expansion of Chevrolet Bros. Mfg. Co. Three types of engines, to be known as Chevrol-Air motors, will be manufactured by the company. One will be a light 4-cylinder engine of 60 to 70 horsepower; the second will be a 6-cylinder type of 125 to 150 horsepower; and the other will have 8 cylinders developing 180 to 200 horsepower.

Arthur Chevrolet is president of the company; Gordon S. Griffin and Byron P. Prunk, vice presidents; and Otto A. Kuehrmann, secretary-treasurer.

**C**APITOL AIRWAYS, INC., of Indianapolis recently established air passenger service over a route extending from Indianapolis to Detroit via Fort Wayne. The plane leaves Indianapolis at 8:30 a.m., Fort Wayne at 9:45, and arrives at Detroit at 11:30 (C.S.T.). The return plane leaves Detroit at 12:30 p.m. (C.S.T.), Fort Wayne at 2:05, arriving at Indianapolis at 3:30. The rate of fare from Indianapolis to Detroit is \$30 and to Fort Wayne is \$12.50.

## ILLINOIS AIR NEWS

**T**HE Velie Motors Corporation of Moline is permanently discontinuing the manufacture of automobiles, and the Velie interests will hereafter be confined to the production of aircraft. Mono-Aircraft, Inc., plans to manufacture planes and engines on a larger scale than ever during 1929.



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Buffalo Air Port

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## CHICAGO AIR NEWS

By DUKE JORDAN

**T**RAFFIC on Chicago's municipal airport is back to normal again with the host of demonstrating ships back in their home hangars or delivered to purchasers during the air show here. The influx of planes during the air show demonstrated concretely the necessity of a larger airport for Chicago. On the opening day of the show, Nelson Kelly, pilot for the Fairchild company, was forced to circle the field for more than 30 minutes before he was able to land.

**C**HARLES HEALY DAY and Chance Vought, both pioneer fliers here at the old Cicero Flying Field, visited with many old time acquaintances during the show. Both were here with their respective company's ships.

**L**EADING other Chicago industries in properly air-marking their structures, the People's Gas, Light and Coke Company has made its new gasometer a great aid to pilots. The tank is 416 feet high and is topped by a 70-foot tower. On the top is painted a sign directing pilots to the municipal airport, two miles to the northwest. It is illuminated for night flying.

**J.** C. KERLIN, *Evansville Courier*; Paul Gregg, *Evansville Press*; Miss Frances Myers, *Champaign News-Gazette*, and the writer were first to fly over the Interstate Airline's new route from Chicago to Atlanta, which opened on December 1. Delayed in Evansville because of bad weather, there was plenty of time for "hangar flying" and it was revealed by Commander Charles T. Blackburne, vice president and general manager of the Interstate Airline, that four of his pilots are former school teachers. George Myers, chief pilot, was a high school principal. The others who have done their bit in educating young Americans are A. J. McKenna, Gene Fricks, and R. D. Harris.

**T**HIS is not an advertisement—but it would be well for pilots flying south to call on John Lovell, manager of the Patton Hotel at Chattanooga, Tenn. There's a reason, and we were not the discoverers of it, because Bill Brock passed a year there with Mr. Lovell. Mr. Lovell has been head of the airport committee for the past 12 years.

**H**OW to provide cities with modern and adequate airports was discussed at a conference of Illinois mayors, secretaries of commerce, airport managers, licensed pilots and state legislators in Danville, Ill., December 11. Hon. A. H. Auth, of Chicago, state legislator, was Chicago representative at the conference.

**M**ARSHALL FIELD, III, Chicago millionaire, has purchased a Keystone-Loening amphibian air yacht. Delivery to Mr. Field is scheduled for this spring. John Hertz, taxi magnate, also purchased a large amphibian.

**Q**UANTITY production of passenger and mail planes (the converted Martin "74" bombing and reconnaissance type) will be under way by June 1, 1929, according to Charles Van Sicklen, vice president and general manager of the Great Lakes Aircraft Corp., in which considerable Chicago capital is invested.

### Aviation Securities Corporation

**A** NUMBER of prominent Chicago businessmen have organized Aviation Securities Corporation, a company which plans to aid in financing aeronautical enterprises both in America and abroad.

Laurence H. Armour is president of the company; John Wentworth, vice president; and John J. Mitchell, secretary-treasurer. In addition to the officers, the directors are: Charles G. Cushing, Paul E. Gardner, Charles F. Glone, E. K. Hardy, Col. Paul Henderson, John Hertz, Robert P. Lamont, Robert R. McCormick, Earle H. Reynolds, Charles W. Seabury, John R. Thompson, Walter B. Wolf, William Wrigley, Jr., E. L. Cord, A. H. Richards, C. M. Keys and James C. Willson.

### American Air Transport Association

**C**OL. PAUL HENDERSON, vice president of both National Air Transport and Transcontinental Air Transport, was elected president of the American Air Transport Association at its annual meeting at Chicago, during the aeronautical exposition. Other officers elected at the same time are: G. S. Shields, and Gen. John F. O'Ryan, vice presidents; and W. G. Herron, secretary-treasurer.

The association maintains in Chicago a central publicity and traffic office under the direction of Harold Crary. During 1928, the planes of the nineteen member companies flew 9,000,000 miles over established airways. Six air transport companies have recently been added to the membership; e. g., the Embry-Riddle Company, Thompson Aeronautical Corporation, Interstate Airways, National Parks Airways, Texas Air Transport, and Maddux Air Lines.

**A**VIATION POST NO. 651, American Legion, Chicago, is sponsoring a general reunion of men who served in the Army, Navy and Marine air forces during the war. All wartime aviators are invited to attend this reunion, which is to be held in Chicago on Washington's birthday, February 22. For information and tickets write to Sidney A. Pierson, 705 United States National Bank Bldg., Indiana Harbor, Ind.

**T**HE Bloxham safety control stick is manufactured by Bloxham-Bergh of Chicago. This control stick is now being used in instruction work at a number of flying schools. This safety stick makes possible the instantaneous release of the student's control in case of an emergency.

**A**IR ACTIVITIES, INC., is operating from an 825-acre tract in West Chicago. An L-shaped flying field is being laid out on 320 acres of this land. When complete, the field will have runways 3,000 feet in

length. Proposed aircraft factory sites border the field. Air Activities, Inc., plans to operate a flying school and sell commercial planes.

**A**IR ASSOCIATES, INC., is establishing a new service and supply station in Chicago. The company has leased hangar space at the municipal airport, where machine shops, stock room and lockers will be maintained. A staff of mechanics will be retained for engine overhaul and other airplane servicing. Air Associates will fill a distinctly needed place in Chicago, for supply and servicing facilities have been lacking.

Avro Avian planes are sold in America exclusively by Air Associates, Inc. The company is also eastern distributor for Lockheed monoplanes and New York parts distributor and service representative of the Wright Aeronautical Corp.

### Universal Air Lines Operations

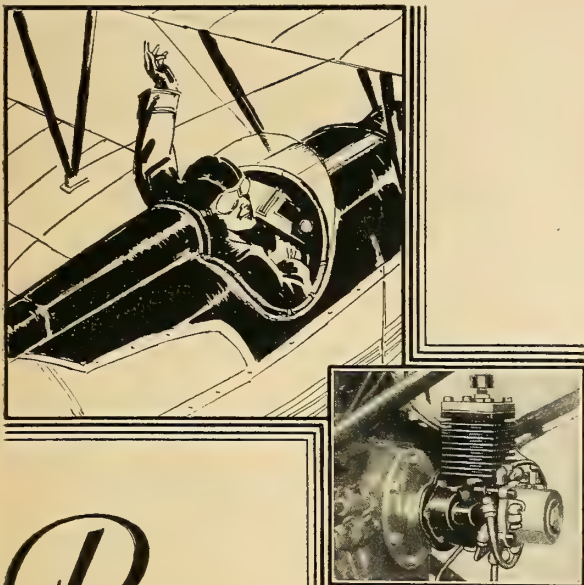
**F**RANK H. ROBERTSON of St. Louis was recently made vice president in charge of all operations for Universal Air Lines System. Mr. Robertson's activities have previously been confined to the operation of the air mail and transport route from St. Louis to Chicago.

Routes operated by Universal Air Lines System extend from Chicago in three directions,—east to Cleveland, northwest to Minneapolis and St. Paul, and southwest to St. Louis and Kansas City. Planes bound for Cleveland leave at 4:00 p. m., arriving at their destination at 7:45. The return plane leaves Cleveland at 6:50 a. m. and arrives in Chicago at 8:35. Leaving Chicago at 9:00 a. m., northbound planes arrive in Minneapolis at 12:30 p. m., while southbound planes leave Minneapolis at 12:01 p. m., and arrive in Chicago at 3:30. The planes leaving Chicago at 9:00 a. m. for the southwest, arrive in St. Louis at 12:15 p. m., and in Kansas City at 5:15. Flying in the opposite direction, planes leave Kansas City at 8:30 a. m., and arrive in St. Louis at 11:10 and Chicago at 3:30 p. m.

The fare from Chicago to Cleveland is \$45.00; from Chicago to the Twin Cities, \$40.00; from Chicago to St. Louis, \$30.00 and to Kansas City, \$55.00.

**A**IR INVESTORS, INC., has been organized as a company which will invest both in established aviation companies and in new aeronautical enterprises. The company has acquired interest in the United Aviation Corp., operator of the airline from Chicago to Atlanta. It also has invested in Scenic Airways, Inc., the air sightseeing company at the Grand Canyon. In addition, it operates through a subsidiary a taxi and sightseeing service in Chicago, in connection with which a new flying field, called Sky Harbor, is being constructed near Glencoe, north of Chicago.

Harvey L. Williams is president of Air Investors, Inc.; George Mixter and La Motte Cohu, vice presidents; Elmer L. Sutherland, treasurer; and Charles S. Martin, secretary.



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### MODEL No. 5



This extinguisher is operated by air pressure, normally charged at 100 lbs. It has two containers, the outer holds one quart of *Pyrene* Fire Extinguishing Liquid, the inner the air pressure, and it is fitted with a standard air valve and pressure gauge. A quarter turn on the control lever simultaneously releases air pressure and opens liquid discharge valve. Can be installed either vertically or horizontally with immediate or remote control. Can be readily refilled with liquid. Weight, charged for use, 9¾ lbs.

### MODEL No. 6



Model No. 6 is somewhat similar to Model No. 5, except pressure is normally atmospheric. A quarter turn of operating lever punctures cartridge, thereby providing pressure, and opens liquid discharge valve. The pressure of one cartridge is sufficient to expel a full quart of *Pyrene* Fire Extinguishing Liquid. Can be refilled with both liquid and new cartridge by unscrewing top casting. Must be installed vertically. Either remote or immediate control. Can be discharged fully or partially. Weight, ready for use, 6 lbs.

Write for folder giving detailed descriptions of these two modern airplane fire extinguishers

## PRESSURE TYPE

IMPROVED  
**Pyrene**  
TRADE MARK  
FIRE  
EXTINGUISHERS

PYRENE MANUFACTURING COMPANY  
NEWARK, NEW JERSEY

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Makers of Fire Equipment Since 1907



## ST. LOUIS AIR NEWS

By A. W. LEAGUE

COMMON sense prevailed over a technical interpretation of the law when the Supreme Court of Missouri reversed its decision holding illegal the vote by which the people of St. Louis consented to \$2,000,000 bond issue for an airport. This will enable St. Louis to go ahead with the plans for the improvement of the field without the necessity of asking the business men of the city to underwrite the improvements, which they would have done had not the court taken the stand it did. In general, the program for expenditure of the \$2,000,000 includes the acquisition of 693 acres of land at a cost of \$485,000; construction of buildings costing \$438,000; expenditure of \$835,000 for grading, drainage and runways; and a total of \$138,000 for roads, water installation, rolling stock, surveying and lighting system. The total of these items is \$1,896,000, leaving a reserve of \$104,000.

THE United States Airways, Inc., of Kansas City, has filed an application with the Public Service Commission of Missouri for permission to operate a passenger line between Kansas City and St. Louis. The company, which also has offices in Denver, proposes to operate two Fokker Universals on the St. Louis-Kansas City route, with a schedule of three hours between the two cities.

THE second air mail line and the third passenger line out of St. Louis was inaugurated on December 1st. This route, which extends from St. Louis to Evansville, Ind., is operated by Interstate Airlines, Inc., and connects with the route from Chicago to Atlanta, Georgia, also operated by the Interstate company. Planes leave Lambert Field daily at 10:30 a. m., arriving at Evansville at noon. There they connect with the southbound plane which is scheduled to leave the Indiana city field at 12:30 p. m. The westbound plane returning to St. Louis leaves Evansville at 1:30 p. m., arriving in St. Louis at 3 o'clock. Fairchild cabin monoplanes are used on the route. Passengers and express are carried in addition to mail. The entire trip from St. Louis to Atlanta is made in a little over six hours. The passenger fare one way is \$55.

ST. LOUIS will be the scene next summer of one of the outstanding annual events in aviation—the international balloon race for the Gordon Bennett Trophy. The money necessary to defray expenses of the race will be raised by the St. Louis Air Board, and all arrangements will be taken care of by that body. The first international balloon race ever held in this country was held at St. Louis in 1907, when a German team captured the trophy.

Lieut.-Col. Paegelow, commanding Scott Field, has proffered the use of fabric tubing used to inflate the balloons and the services of 300 soldiers, experienced in balloon handling, to take charge of the inflating and starting. The site of the start has not been selected. Stanley Clarke, chairman of the

Air Board, has been selected as chairman of the general committee in charge of the race. Other members of the executive committee are Maj. A. B. Lambert, Capt. H. E. Honeywell, prominent St. Louis balloonists, Edwin B. Meissner and W. W. Smith.

THE first of the new six-place Ryan monoplanes has been turned out by the Mahoney-Ryan plant at Lambert Field. This is the first plane to be turned out at the local plant which plans to be in full production after the first of the year. The ship differs slightly from the old-style Ryan in that it has a slightly larger wing and includes a number of refinements. There are places for two pilots and four passengers, dual controls being a part of the regular equipment. The ship ultimately will be powered with the new Wright J-6 300 horsepower motor in place of the J-5. The first ship of the new model was put out in de luxe style for exhibition at the Chicago aeronautical show.

B. F. Mahoney, organizer of the Mahoney-Ryan Aircraft Corporation, has resigned as president of the company and has sold all his stock in the company. The company is controlled by a St. Louis syndicate headed by Phil DeC. Ball, Harry H. Knight and Harold K. Bixby.

THE Shell Oil Company, located in St. Louis, has purchased a trimotored, 16-passenger Fokker, to be used by company officials for business trips to various cities where branches are located. Milt Girtton, former chief pilot for the Von Hoffmann Aircraft Corporation, is the pilot for the new job. The plane was exhibited at the Chicago show.

FRANK H. ROBERTSON, president of the Robertson Aircraft Corporation, has been appointed general operations manager for all subsidiaries controlled by the Universal Aviation Corporation, of which the Robertson company is a member. He is also chairman of the operating committee. Bert Ison, chief flying instructor for the Robertson School in St. Louis, has been appointed operating manager for the Chicago terminal and Alvin D. Niemeyer will succeed Ison at St. Louis.

THE Illinois Central has made an agreement with the Robertson Aircraft Corporation to issue round trip tickets between St. Louis and Chicago which will enable passengers to ride one way via airplane. The tickets are so marked that a passenger may ride to Chicago via train and return via airline, or vice versa. Tickets are sold at both the railroad and aircraft ticket offices. The round trip fare under the combination ticket plan is \$40.

THREE combination mail and passenger planes, powered each with a Wright Cyclone engine, have been ordered from the Stearman Aircraft Company for use on the mail route between St. Louis and Chicago. A mail compartment with a total capacity of 600 pounds will be directly behind the motor. Immediately to the rear of the mail compartment will be a four-passenger cabin.

The pilot will be in an open cockpit to the rear of the passenger cabin, giving him exceptional visibility. The passenger cabin can, whenever necessary, be used to carry an additional 500 pounds of mail.

DEFINITE assurance that the United States Army has no intention of discontinuing its lighter-than-air activities at Scott Field was received by the air board of the chamber of commerce. The next step planned by the chamber is to secure adequate appropriations for the continued operation of the field.

THE first building of the Parks Aircraft, Inc., factory at Parks Airport is nearing completion and will be in operation by the first of the year. The two-story brick office section of the building is now in use, and machinery is being installed in the plant. The building is 380 feet long by 100 feet wide and has a steel frame and glass sides. The first two ships have been built in the Parks Air College shops and will be flight tested this month. The ships, which are of the cabin monoplane type, have a high lift wing and are powered with Whirlwind motors. A modern hotel is being planned at Parks Airport, to be operated separately from the dormitory in which students are quartered. Plans call for a 60-room structure which will contain all modern conveniences.

### Parks Air College Post-Graduate Course

A POST-GRADUATE flying course, with specialized training in night and "blind" flying and a comprehensive ground school curriculum, will be opened on March 1 by the Parks Air College, operating at Parks Airport in the St. Louis metropolitan district, three miles south of East St. Louis.

The course is open only to licensed limited commercial and transport pilots. It is designed to give the finishing training necessary to equip the pilot for all types of flying.

BREAKING all records for any other period in the history of aviation schools, a total of 94 students arrived at Parks Air College, during October and enrolled. These students came from 22 different states, and one arrived from Mexico, a representative of the Mexican Air Service.

There were over 470 students enrolled at the end of November.

## MISSOURI AIR NEWS

Nicholas-Beazley Catalog

THE Nicholas-Beazley Airplane Co., Inc., of Marshall, has issued a new catalog which gives a complete listing of all the airplane engines, parts and supplies which the company handles. Neatly bound, this catalog includes more than two hundred pages describing and illustrating the products distributed by this company. The line ranges from engines and parts to flying togs and books on aeronautics. Tables on metal alloys and heat treatments, standards for gauges, decimal equivalents, and screw and rivet gauges are included at the back of the catalog.



To help you see . .  
... inside your engine

**M**OTOR heat temperature and lubricating oil temperature . . . these are the pulses that indicate the state of health of your engine.

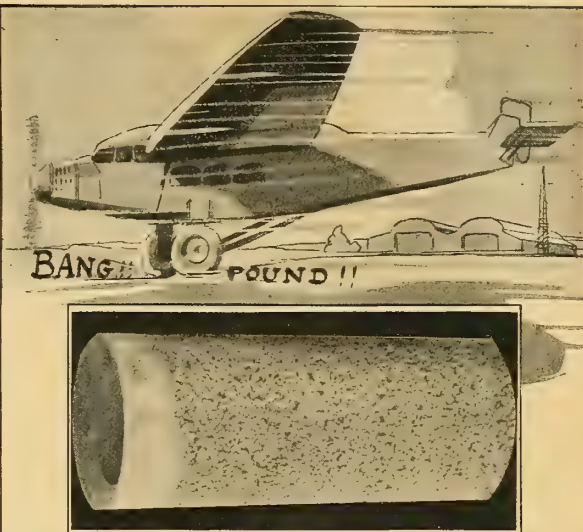
To be able, at all times to know these temperatures is just as good as being able to see *inside* the engine while it is running.

But your instruments must be absolutely dependable or the information they give is worse than useless.

Insist on Boyce Motor Meter Heat Indicators . . . for safety's sake.

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**RAILROADS** do not question the necessity for instantaneous and perfect drainage at depots and along track beds. They know that flooded stations and tracks mean financial loss, interrupted schedules, and perhaps loss of life.

**AIRPORTS**, the depots of air transportation, present far greater dangers when not ideally drained. It is because of this that the best drained airports use "Poroswall" Rapid Drain Pipe. Its walls are *porous* and its *joints tight*. the former feature insuring "A Foot of Drainage for Every Foot of Pipe," the latter *Better Alignment, Better Flow-Lines*, and hence *Ten Times Drainage*.

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Walker Cement Products, Inc.  
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**WALKER**  
**POROSWALL**  
RAPID DRAIN PIPE





## KANSAS CITY AIR NEWS

By H. H. JAMES

THE Missouri Supreme Court has reversed its decision of a few weeks ago and has now declared the bonds voted for the purchase and improvement of the Kansas City Municipal Airport are valid.

The decision will mean that the municipal airport site will be purchased and improvements rushed. The airport is located within five or six minutes of the downtown business district, in a bend of the Missouri River across from the city to the north. One of the first improvements to be made is a levee along the river to prevent overflow of the field. The Federal Government will probably assist in this work. Long concrete runways and additional hangars also will be provided.

THE Kenyon Air Transport Company of Kansas City has established a passenger service between Kansas City and Springfield, Mo. J. M. Kenyon is head of the company.

THE Porterfield Flying School, subsidiary of the American Eagle Aircraft Corporation, has adopted a new policy whereby students may enroll in the school and, with the exception of a small down payment, pay their tuition after completing the course and when their work is on a "paying basis."

THE U. S. Aircraft Engineering School has been opened here. Courses in aeronautical engineering, aircraft design, aero-

dynamic, stress analysis and airport designing are offered. Night classes are held for those employed in the day.

A NEW flying school, a subsidiary of the Beacon Airways of America, will be opened in Kansas City soon. It will be known as the Consolidated Air College. The Rankin System of instruction will be used. Flying activities of the school will be at the municipal airport, while an uptown school for the lecture courses will be maintained. The officers of the new school are: Franklin W. Hemingway, president; William Ong, vice president; Joseph F. Porter, Jr., secretary-treasurer; Fred K. Baxter, manager; Carl Zeir, chief pilot, and F. E. Davidson in charge of ground operations.

CONSTRUCTION of the new American Eagle Aircraft Corporation factory in Kansas City has been started. E. E. Porterfield, Jr., president of the company, and his co-executives broke ground recently with impressive ceremony. The factory will be complete around January 1.

The factory, which is to have a minimum annual output capacity of 1,200 airplanes, is situated on a two-acre tract adjoining Fairfax Airport, one of the best laid out and equipped flying fields in the United States.

There will be a two-story administration building, a main factory building, 350 x 100 feet, and two dope and paint buildings, each 50 x 100 feet. The factory is laid out for straight line production, materials going in at one end and the finished airplane coming out at the other.

## IOWA AIR NEWS

By R. W. MOORHEAD

THE state of Iowa is now served by five transcontinental planes daily, three of which stop at the municipal airport in Des Moines, and two at the government airport at Iowa City.

The Des Moines planes include two on the eastbound transcontinental line from San Francisco to New York. The other is a westbound plane from Chicago to Lincoln, Nebr., which connects here with fast train service west.

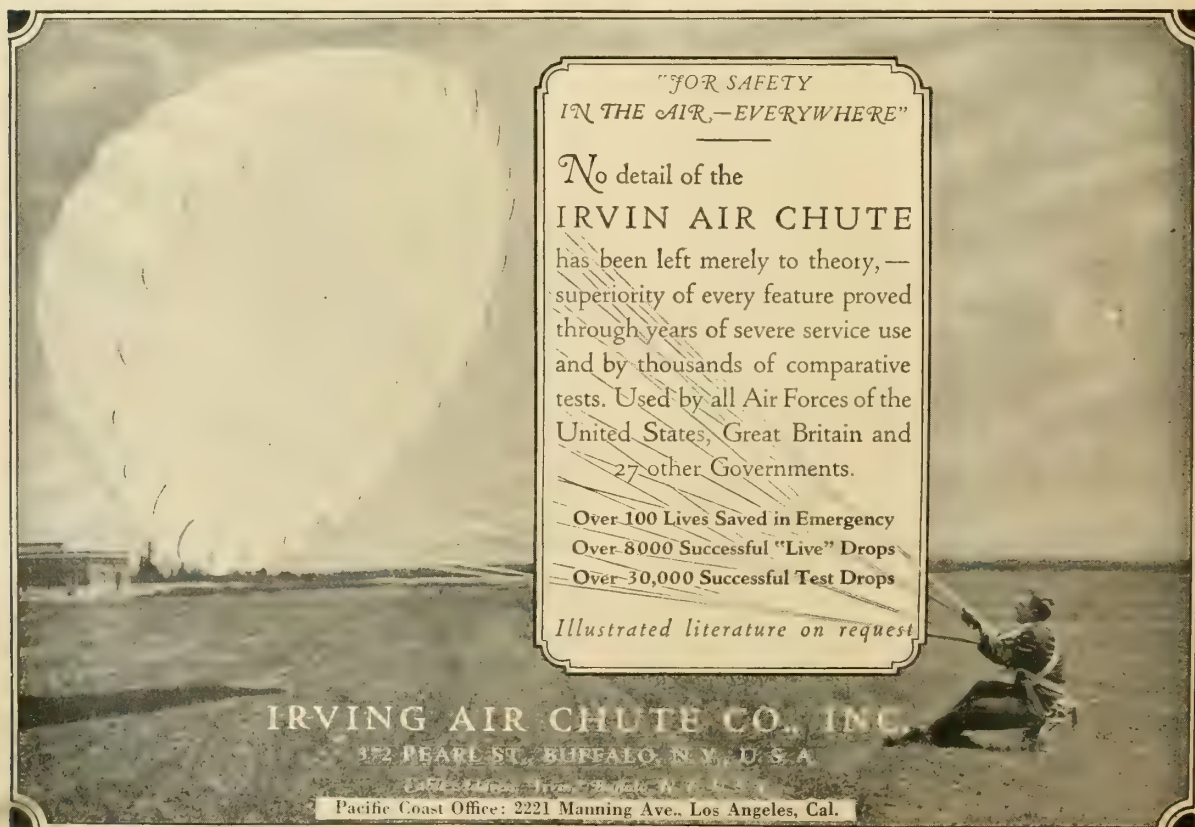
The Iowa City planes are the westbound transcontinental planes from New York to San Francisco.

THE Iowa Railway and Light Company of Cedar Rapids will soon remove its wires, which skirt the airport field, to a site one mile from the field. The company has pledged a gift approximating \$20,000 to the present campaign to improve the airport.

AT a recent meeting of the Midwest Airways, Inc., held in Monmouth, Ill., John Livingston was re-elected president; Fiske Marshall, vice president; and A. B. Chambers and Mr. Marshall were elected to the board of directors.

FRANK E. CALDWELL, assistant general superintendent of Boeing Air Transport, has been in Des Moines recently directing plans for constructing at the Des

(Continued on next page)



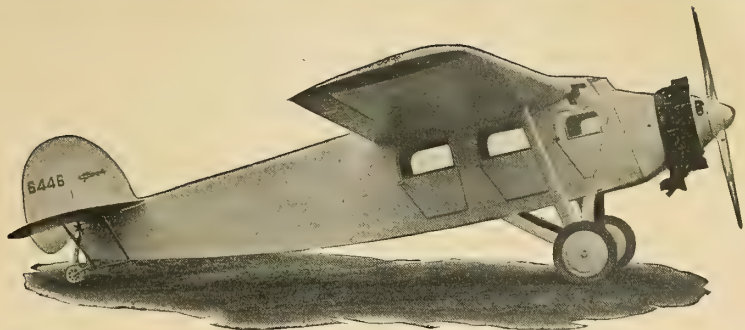
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## Cessna's New Creation

Built with the same fine engineering principles which have brought the Cessna 4-place Cantilever Cabin Monoplane so many notable victories, this new 6-place Transport established a name for itself on its maiden flight from Wichita to Chicago.

With its Whirlwind motor averaging but 1600 R.P.M.'s, it carried a pay load of 1150 pounds, passengers and baggage, at an average speed of 121 miles per hour over the entire trip—730 air miles.

With the new J-6, (300 H.P.) for which it is built, it should easily cruise at an average speed of 110 to 115 M.P.H.

Let us tell you more about these fine cruisers of the air—request on your letter-head will bring full details.

**Cessna Aircraft Company**  
**Wichita, Kansas**



## PROPHECY

for Airport Officials

**9 out of 10** Soil Technology enters the field of aviation today as one of the most important basic factors in airport design and construction.

Experience and investigations made by our Soil Technologist enable us to know that approximately nine out of ten airports being conditioned today will, a short time hence, exact a toll of expense in reconditioning far greater than if the drainage problem were adequately solved today. We can be specific.

**Airport A** The drain tile is not placed at depths consistent with the soil types. Much important surface area has been puddled by rolling, rendering perfect drainage impossible. Over \$80,000.00 worth of damage to planes has resulted from faulty drainage during the last two years. The condition will grow worse.

**Airport B** A miry section was drained and the airport officials were surprised that when this section became dry another and more important section developed, an even greater degree of water logging.

**Airport C** The soil types were not properly estimated, or perhaps not taken into consideration. Ground Pockets have developed and will continue to develop. If a wheel strikes one on take off or landing—

We could go on almost without end. In each case the drainage has been undertaken by local contractors or engineers whose knowledge and good intentions we acknowledge and respect.

But we are specialists. Much of our work during the past nine years being devoted to expensive reconstruction necessitated by unscientific initial installations. We can help you make a better airport today, one that will cost you far less in the end. We know.

We have some vital information for those interested in better airports. Send for it today. We work co-operatively with the airport engineer or local contractor or take over the entire planning and engineering from start to finish.

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AND ASSOCIATES

*Airport Drainage*

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Engineers - Constructors

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(Iowa Air News continued)

Moines municipal airport a large concrete-topped servicing platform for planes, which will be located about 150 feet north of the city hangar. Underground tanks, flush with the ground, will contain large supplies of aviation gasoline and oils.

**ROY N. COVERT**, official of the United States Weather Bureau, supervised installation of the weather station equipment at the Des Moines airport. Walter F. Butcher, Des Moines representative of the Boeing Air Transport Company, will make the observations at this station.

Weather stations will also be established at the airports in Atlantic, Iowa City, Montezuma and McCausland.

**PILOT F. C. ANDERSON** has announced a traveling flying school, sponsored by the Des Moines Airways, which will send planes to the students if the students cannot come to the school.

Headquarters will be at the Des Moines municipal airport, where the school opened with an enrollment of seventeen students.

Pilot Anderson plans to spend two days of each week flying to places in Iowa where flying students desire to take instruction at home, using the nearest airport or landing field.

**AVIATION** enthusiasts at Drake University, Des Moines, will study aerodynamics next semester, when a course in the scientific principles of flying will be given by Prof. P. S. Helmick, head of the physics department. A meteorology course was offered during the present semester.

**THE** Kari-Keen School of Aviation was organized five months ago at Sioux City, Iowa, and thirty-five students are now enrolled with more coming in each week. Six Hisso Travel Airs are used for student work.

## WICHITA AIR NEWS

By EDWIN W. PRYOR

**WICHITA'S** newest flying school, the Air Service, Inc., started its first classes December 11, with eleven students present. Another class of twelve started that night, and plans are in progress for a third class to start the first of January.

The course calls for six weeks in ground school before flying instruction is started. A. L. Yeider, superintendent of maintenance, and G. A. McDonald, superintendent of operations, have charge of the beginning classes.

**WALLACE BEERY**, famous screen star, received delivery on his Wasp-powered special Travel Air monoplane about the middle of December. George Lavy, his pilot, was with him, and the two flew to Los Angeles. The special job has bridge tables and two lounges built into the cabin.

**LIEUT. RICHARD H. LESS, JR.**, Department of Commerce aeronautical inspector, has been assigned to the Wichita territory again.

**STUDENTS** at the Braley Flying School have organized the Beta Phi Sigma fraternity. Other chapters will be formed throughout the United States, according to present plans.

**THE** gasoline tax hits everyone in Wichita but aviators and farmers, it was discovered recently when the state balanced books, refunding taxes. Since the aviators do not use the roads, the tax on their gasoline is refunded. Travel Air Mfg. Co., Inc., was refunded \$328, or the tax on 16,400 gallons.

**THE** Wichita Air Service Provision Company (WASP) has secured from the city a good location on the new municipal airport, and shortly after the first of the year will begin construction on a first class hangar, to cost \$25,000, according to Dan Sauder, president.

The hangar will be 80 by 100 feet, of brick, and two stories high. The ground floor will accommodate 14 small planes and a repair shop, while the upper floor will be for students. A complete servicing station will be installed also.

**THE** six-place Cessna cantilever wing monoplane, the largest turned out by Cessna, drew much favorable attention at the Chicago exposition. Clyde Cessna, designer and president of the company, is designing an even larger transport plane, it is reported. One design he is at work on calls for the wing to carry all the weight, balanced by enough tail to counteract the motor weight — in other words, passengers and load will ride in the wing.

**HOWARD JONES**, formerly with the Quick Air Motor Company, is now test pilot for the Knoll Aircraft Company.

**THE** tiny "Cadet," one-place biplane built by the Blue Streak Motors Company, was given its test flight recently and passed in good shape. Immediate production is planned.

**ORDERS** for two ships for immediate delivery, and ten for delivery during 1929, were the result of a 14-day trip to the Pacific Coast recently by R. U. McIntosh, new sales manager for Cessna Aircraft Company.

Jack Pryor, head of the motor department, is making a tour of Texas and Oklahoma with an Anzani-powered Cessna.

**EARLY** morning weather reports from Kansas City or Oklahoma City are available for all pilots at the Travel Air field in Wichita now, due to the establishment of the government radio station there. Inasmuch as the majority of planes leaving here are headed for one or the other of those cities, the information is very valuable.

**HUTCHINSON** and Herington are two of the latest of Kansas towns to provide municipal airports. Herington has leased a 400-acre tract of land and is planning improvements immediately.

**GEORGE R. BASSETT** has been named general manager of Swallow Airplane Company, succeeding Victor Roos, who has served in that capacity for the past year.

He takes charge of the company just as it is entering a period of expansion, having recently been recapitalized for \$1,000,000.

**CONSTRUCTION** work on the first unit of the Knoll Aircraft Company plant, adjoining the Travel Air field, is being pushed rapidly. The erecting of a paint and dope room will be completed soon and construction of a main unit, 150 by 200 feet, will follow. The factory will cost \$75,000, according to contractor's estimates.

The first ship of the new firm, now housed in the old building of the Laird Aircraft Company, is due for its test flight soon. The Knoll company plans the production of large transport planes, as well as of the smaller sport and commercial jobs.

Felix Knoll, well known German designer, is vice president and designer for the company. An imposing array of German talent is joining the staff. On their way here are: Karl Ziller, chief engineer in the Dornier factory; Ernst Froelich, departmental chief in the Rohrbach factory; Egon Winter, in charge of the statics department of the Dornier factory; and Dr. Friedrich Dawid, aerodynamics and statics authority of Berlin and Vienna. Charles E. Quick, local motor expert, is factory superintendent, and Dick Bollby is superintendent of the welding department. Gerhardt Schmidt of Germany heads the wing department.

**WICHITA** men are majority stockholders in the Okay Airplane Company of Muskogee, Okla. General offices and demonstration facilities will be in Wichita, according to present plans.

Charles N. Martin is president; Earl E. Bidwell, is vice president and general manager. The company plans construction of three types of ships,—a small training monoplane, a medium-sized cabin monoplane, and a large transport cabin monoplane for seven passengers and pilot.

**THE** Braniff Air Lines of Oklahoma will extend service to Wichita in the near future, according to Paul Braniff, Travel Air dealer for the state. The lines now operate daily between Oklahoma City and Tulsa. Extensions planned are: from Oklahoma City to Dallas and Fort Worth; Tulsa to Kansas City via Bartlesville; and Tulsa to Wichita via Ponca City.

Plans for the lines are being rushed by the recent oil field discovery in Wichita, with the subsequent heavy traffic of oil men between Tulsa and this city.

**IRA "BIG MAC" McCONAUGHEY** sold many Travel Air planes on a recent tour of Mexico.

**AT** the Chicago show, contracts were made with the Travel Air Mfg. Co., Inc., by 35 dealers, for the purchase of planes amounting to \$2,000,000. A new third unit of the Travel Air plant, now under construction, will help provide facilities for the production of these planes.



"Joe, I knew you'd like that fight. Those boys were rugged, they had real stuff in 'em. I tell you it takes lots o' that to make good boxers."

"Jim, it takes lots



# STAMINA

o' that to make anything good. That's why I got over here through that storm. My Stearman just had it, that's all. Yes, that was a real scrap—I enjoyed it."

*The* STEARMAN AIRCRAFT CO.  
WICHITA, KANSAS

## At Chicago International Aeronautical Exposition HASKELITE EXCEEDED USUAL HIGH PERCENTAGE OF USERS

AT the International Aeronautical Exposition, HASKELITE more than maintained its consistent record of providing 85% or more of the plywood used in American-built airplanes. In fact, 87.5% (42 out of 48) of the American exhibitors employing plywood were HASKELITE users. Only proven merit could have won such recognition of the superiority of blood albumen glued plywood.

Interest in the HASKELITE exhibit also reached a high mark. In addition to

wings, spars, and similar HASKELITE parts, new insulating and decorative panels were shown. The insulating panels were made with cores of Balsa wood, Celotex, Masonite, and other insulating material for both HASKELITE and PLYMETL. The decorative panels were molded of various woods, such as are now used in radio cabinets. These are to be introduced for aircraft instrument boards.

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## OHIO AIR NEWS

By T. E. LUNSFORD

**P**LANs for the operation of the Ohio State School of Aeronautics have been announced by C. F. Ricketts, manager of the Sullivan Avenue Airport at Columbus. A new building for housing officers, weather bureau station, club and student quarters, lunch counter and sleeping quarters for visiting pilots has been completed. Walter Sarley, former instructor at Orin Welch Aircraft School, Anderson, Ind., has been engaged as instructor.

**L**IEUT. FRANK M. McKEE, commandant of Norton Field, Columbus, for the past three years, has been ordered to Washington for duty with the Air Corps. Lieut. Adolphus R. McConnell, Langley Field, Va., will succeed Lieut. McKee.

**E**RECTION of the largest building in the world, the \$2,000,000 hangar in which the Goodyear-Zeppelin Corporation will build two dirigibles for the Navy, has been started at Akron.

The hangar, which is being constructed by the Clemmer-Noah Construction Co. of Akron, will have an unobstructed floor area of 389,000 square feet. It will be 1,200 long, 325 feet wide and 200 feet high.

**T**HE All-American Aircraft Co., Inc., recently incorporated for \$100,000, will soon start to manufacture a plane designed by D. C. Babcock. The two-seater plane weighs but 650 pounds and is equipped with a five-cylinder LeBlond engine.

**A**SOLUTION for the Canton airport problem, which has been hanging fire for several months, has been presented to Mayor C. C. Curtis and the city council by a group of business men who have organized the McKinley Aeroways, Inc.

The company has taken over the lease of the McKinley Airport, on the Louisville Road, with an option of purchasing additional land to make an adequate field. The company has offered the city joint use of the field under a 20-year contract, provided the city will pay the taxes and the lighting cost. The company plans to go forward with the development regardless of what the city does and will install hangars and lights.

**T**HE Aerial Transit, Inc., of Youngstown, has been incorporated. Incorporators are C. F. Smith, David E. Jones and T. Lamar Jackson. In addition to manufacturing airplanes, the company intends to operate an air transport line for passengers, express, freight, mail baggage.

**A**VIATION COLLEGE, INC., has been incorporated by the following Akron citizens: R. W. Barnes, High Robbins and Allen T. Simmons. Four courses of ground instruction will be offered for the development of aeronautical engineers and mechanics.

**O**RIGINALLY designed by the Navy for establishing communication with ships navigating the Great Lakes, a radio-tele-

graph station at Cleveland has been converted into an aircraft radio beacon station for the transmission of messages to aviators flying in the vicinity of the Cleveland airport. A new 2000-watt transmitting set, similar in features and power rating to many of those at our broadcasting stations, is being installed. It is capable of sending both voice and code messages. The transmitting and receiving outfits are to occupy a new building which is now in the process of construction, and a contract has been awarded for the erection of new 125-foot steel radio towers or masts.

## Goodyear Hangar Construction

**C**ONSTRUCTION work has started on the great airship hangar of the Goodyear Zeppelin Corp. at Akron. The hangar is being built at the new Akron Airport. More than 200 feet high, the base of the hangar will be 1,175 feet long and 325 feet wide. The floor area will be 389,000 square feet. The construction will require more than 6,000 tons of steel, 1,300 concrete piles and 7,000 yards of concrete.

The two new rigid airships which the Goodyear Zeppelin is to build for the U. S. Navy will be assembled and housed in the hangar. Each of the airships will measure 785 feet in length and 134 feet in diameter, and will have a capacity of 6,500,000 cubic feet of helium.

**T**HE Truscon Steel Company of Youngstown has established an aeronautical division. The company manufactures steel hangars. Hugh C. White has charge of the company's aeronautical activities.

**U**. H. BOLL has joined the airplane tire and accessories sales division of the Goodyear Tire and Rubber Company of Akron. Mr. Boll was associated with the civilian organization at McCook Field, Dayton, during and following the war.

**T**HE Parker Appliance Company of Cleveland manufactures tube couplings for airplanes in 16 standard shapes and several variations of combination shapes. These couplings may be obtained either in aluminum or brass. The company's line of products also includes such airplane fuel distribution units as fuel line cocks, flow indicators, pressure relief valves, and tank flanges.

**T**HE Goodyear Zeppelin Company is constructing two non-rigid airships similar to the *Puritan*. With a capacity of 86,000 cubic feet, each of the new ships will be 126 feet long and 34 feet in diameter and each will be powered with two engines.

**A** SHORT aviation dictionary was published in the November issue of "Sky Traffic," house organ of the Embry-Riddle Company at Cincinnati. About 60 terms commonly applied to airplane parts, instruments and maneuvers are explained briefly and intelligibly.

**D**URING the Chicago air show the Little-Greiner Flying Service, Inc., of Springfield, acquired the sales agency for Travel Air planes in 12 counties in Ohio. The company has placed an order for ten ships powered with Wright Whirlwind engines.

Upon the delivery of these planes, the company plans to hold a local air show in Memorial Hall, at which time five different Travel Air models will be exhibited.

**T**HE citizens of Dayton, diplomatic representatives from nearly 50 foreign countries, sixty of the leading aircraft manufacturers and governmental dignitaries paid tribute in Dayton to Wilbur and Orville Wright on December 10. A scroll entitled "a Tribute of Affection" was presented to Orville Wright, and a wreath was laid on Wilbur Wright's tomb by Brig. Gen. Lord Thomson, former British Minister of Air, on behalf of the foreign delegation. The Army aeronautical laboratories at Wright Field were inspected.

## CLEVELAND AIR NEWS

By DAVID E. IRWIN

**T**WO thousand Clevelanders greeted some of the world's leading aviation figures when foreign delegates to the International Civil Aeronautics Conference boarded a fleet of airplanes here to fly to the Chicago aviation show.

A luncheon, attended by seven hundred aviation leaders and enthusiasts of Cleveland was served in the new National Air Transport hangar at Cleveland Airport before the party embarked in thirteen planes for Chicago.

Ambassador Myron T. Herrick was the principal speaker and was accorded a roaring welcome. Each of the foreign delegates was introduced and gave a short talk. The foreign delegates included Gen. Hofrat Deutelmöser, who commanded the Austrian air forces in the World War; Brig. Gen. Lord Thomson, former British secretary of air and general in the British Royal Air Forces on the western front; Pierre Etienne Flandin, minister of aviation for France during the war and now president of the Aero Club of France and vice president of the French Chamber of Deputies; Maj. Georges Thenault, a commander of the famous Lafayette Escadrille; Ahmed Moukhtar Bey, Turkish ambassador to the United States; Lieut. Col. Phra Amara, of the Siamese delegation.

Among the Clevelanders who took part were: Major John Berry, airport superintendent; City Manager Hopkins; Mayor John D. Marshall; Samuel Mather; Maj. Thomas J. Herbert, commander of the 112th Observation Squadron, Ohio National Guard; Roy B. Robinette, vice president of the chamber of commerce, Floyd J. Logan, Postmaster H. A. Taylor, William Ganson Rose and consuls of foreign countries represented by delegates. Russell Lowe, publicity director of the chamber of commerce, arranged the luncheon and the reception of the delegates.

(Continued on next page)

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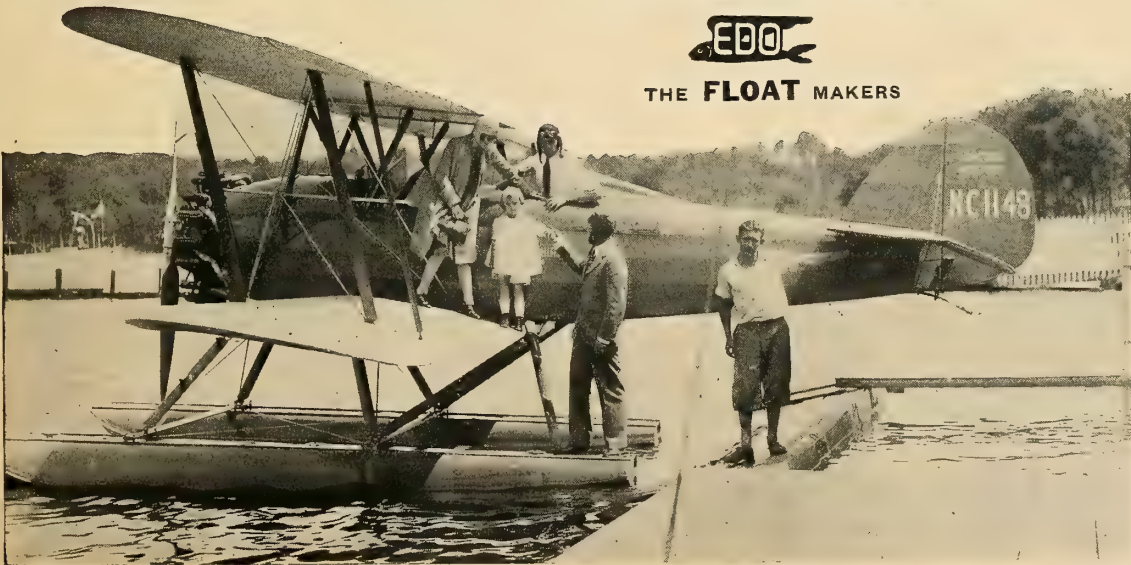
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**THE FLOAT MAKERS**





(Cleveland Air News continued)

**N**ATIONAL Air Transport plans to open passenger service with trimotored Ford ships between New York-Cleveland-Chicago by the first of the year.

**MAJOR JOHN BERRY**, superintendent of Cleveland Airport, reported that 61,000 planes have cleared the port here since it was opened July 1, 1925. Airlines into and out of Cleveland fly 6,418 miles every day, which is 18 per cent of the total of 33,792 miles flown in the United States.

**JOY V. McCLAFIN**, of Bicken, Ind., is flying the "shuttle" plane between Akron and Cleveland for Continental Air Lines. The line operates a Temple monoplane on the route.

**T**HE city council has approved the issuance of \$400,000 in bonds for the improvement of Cleveland Airport. Of this amount \$200,000 is to be used for grading, filling and construction of a huge concrete apron fronting the hangars. The remainder of the fund is to be used for purchasing additional land.

**T**HE AUSTIN CO., Cleveland engineering firm and builder of many hangars, has entered the airport field.

**W. E. Arthur**, airport division manager of the company, is in Muskogee, Okla., superintending the laying out of a municipal air field there.

**W**ORK has been started on the installation of beacons on the Cleveland-Buff-

falo leg of the Cleveland-Albany airway. The lighting is expected to be completed by the first of the year.

Eighteen 2,000,000 candlepower beacons are to be erected at ten-mile intervals on the route. Five will be at emergency fields at Painesville, Ashtabula, Conneaut, Westfield and Dunkirk. The Keystone Construction Co. of Virginia is doing the work.

**S**EVENTY-FIVE members of the 112th Squadron Association, social body of the 112th Observation Squadron, Ohio National Guard, attended a smoker here Thanksgiving eve. Vaudeville acts were part of the entertainment which was held at Hotel Olmsted.

The guard unit has obtained a new O-11, giving it three of this type and three P-Ts.

**C**LEVELAND Airport is to be a station of the Curtiss Flying Service. Operations of the company will include crop dusting, aerial photography, local taxi service and cross-country flying.

**T**HE flood lighting of the new Terminal Tower Building, recently completed by the Graybar Electric Company of New York City, should prove an aid to night fliers. More than 235 floodlights illuminate the tower of this building.

**T**HE Northeastern Flying Service has contracted for a 10-passenger service plane from the Great Lakes Aircraft Corp., the company which recently took over the Glenn L. Martin properties in Cleveland.

## KENTUCKY AIR NEWS

By JOHN WALKER ROGERS

**D**AILY airplane service between Louisville and Evansville was established when the first plane of the Interstate Air Lines, Inc., left the Louisville airport in Seneca Park for Evansville, December 1.

Passengers, air mail and merchandise are carried. J. E. Belden is divisional traffic manager for the company. Tickets are on sale in the hotels, and transportation to the airport is furnished for passengers free of extra charge.

**T**HE lease giving the Louisville and Jefferson County Air Board control of Bowman Field, the municipal airport in Seneca Park, for five years, has been signed by the board of park commissioners.

New hangars will be erected on the northwest side of the field, and the field will be fully lighted.

**J. E. COOK** has succeeded Jack R. Rollins, pilot, as the district manager of the Aviation Transport and Service Corporation. This company maintains an office at Louisville for the purpose of enrolling students in the aviation school conducted in Chicago.

**T**HE National Aviation School has been formed at Louisville and will be directed by E. J. Pinaire and Joseph Murphy. Flight training will be given at Bowman Field during the coming year.

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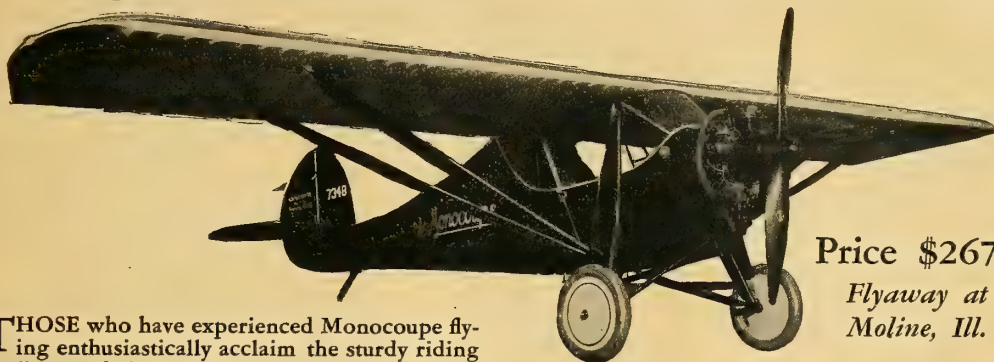
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Indicative of the fact that Monocoupe is fulfilling the ever-increasing demand for private flying, comes this interesting statement regarding airplane production for 1928: Of the total govern-

ment approved airplanes produced by all manufacturers during the *entire year*, more than 10% were Monocoupes built and sold in only *six months*.

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## PENNSYLVANIA NEWS

**PITTSBURGH AVIATION INDUSTRIES CORP.** has been formed for the purpose of coordinating endeavors to control, manage and develop local aeronautical enterprises.

George R. Hann, a director of the Fairchild Aviation Corporation, is president of the Pittsburgh corporation. Five subsidiaries, with identical boards of directors, have been formed under this corporation. They are the Pittsburgh Air Transport Corporation; the Pittsburgh Aviation Securities Corporation; the Pittsburgh Aviation Management Corporation; the Pittsburgh Aerial Survey Corporation, and the Pittsburgh Aircraft Agency Corporation.

The parent corporation's board of directors is: George S. Davison (Chairman), Taylor Allderdice, Norman Allderdice, A. E. Braun, James F. Burke, John F. Casey, J. C. Chaplin, F. J. Chesterman, W. L. Clause, W. G. Costin, Samuel Diescher, Maurice Falk, George R. Hann, J. H. Hillman, Jr., A. L. Humphrey, Edgar J. Kaufmann, Morris Knowles, George T. Ladd, Irvine F. Lehman, F. A. Leovy, J. E. Lewis, Walker L. McCune, R. B. Mellon, R. K. Mellon, W. L. Mellon, John F. Miller, W. L. Munro, E. W. Mudge, Harrison Nesbit, F. F. Nicola, George P. Rhodes, A. W. Robertson, H. H. Robertson, H. B. Rust, J. B. Shea, Lloyd W. Smith, and A. W. Wyckoff.

**LIEUT.** Kenneth G. Fraser has been added to the executive staff of the Keystone Aircraft Corp. of Bristol. Lieut. Fraser was an Army Air Corps officer before and during the war. Later he was associated with W. E. Boeing and the Huff-Daland Dusters, Inc.

**TEST** flights for the second K42A training plane ordered by the Argentine Naval Air Corps were recently made at the Keystone Aircraft Corporation's field at Bristol. Kenneth G. Fraser made the test flights for the Keystone company, and Lieut. Edgardo Bonnett, for the Argentine Naval Commission.

The second Keystone Patrician is being assembled, and soon will make a demonstration flight over the various airlines of the country.

### The Aircraft Industry in the Philadelphia District

**I**N or near Philadelphia, there are quite a number of good landing fields and airports, and several industrial concerns engaged in building either aircraft or parts. One of the most important new flying field developments is Central Airport at Camden, N. J., just eleven minutes by auto from Philadelphia. When completed, this will be one of the finest airports in the East. The naval air station at Lakehurst, N. J., is but a half-hour distant by air.

At Bryn Athyn, on the city's border, is the test flying field and factory of Pitcairn Aviation, Inc. Near Wilmington and a few miles from Philadelphia, the Bellanca Aircraft Corporation operates its factory. The

Bellanca flying field covers more than 300 acres and affords landing facilities for both land and seaplanes, since it adjoins the Delaware River.

At Bridgeport, 16 miles from the city, is the plant of the Summerill Tubing Company, which manufactures seamless steel tubing for aircraft. At the Metallurgical Laboratories, Inc., there are complete research and testing facilities for the study of alloys and metals used in aircraft and there are also furnaces for heat-treating engine and aircraft parts.

At Temple University, the Navy Department conducts a preliminary training course in aeronautics.

The naval aircraft factory, where both airplanes and dirigibles were produced during the war, is located at the Philadelphia Navy Yard. This plant is now used for research and testing.

At Bristol, a few miles from the city, is the factory of the Keystone Aircraft Corporation, where both military and commercial airplanes are manufactured.

## NEW JERSEY AIR NEWS

### New Airport at Camden

**THE** site for the new Central Airport, Camden, is only eleven minutes by motor car from the Philadelphia postoffice. According to present plans, this airport will be ready by next June. Runways, ranging in length from 2500 to 3500 feet, will extend in eight directions. When finished, the airport will be completely lighted, and will include an administration building and a passenger station with a restaurant, ticket office, etc.

The officers of Central Airport, Inc., are: N. S. Ludington, president; R. Sanford Saltus, Jr., vice president; Robert P. Hewitt, second vice president; C. C. Savage, Jr., secretary; and W. C. Roberts, treasurer.

**E. E. ALDRIN** recently resigned from the Army Air Corps to accept a position as manager of the aviation department of the Standard Oil Development Company at Linden.

**"WHAT PRICE NIGHTMARE?"** is the name of a pamphlet recently prepared by the Pyrene Manufacturing Co. of Newark. In this pamphlet, the various uses of Pyrene products are vividly portrayed in their actual colors.

## ALABAMA AIR NEWS

By ROBERT H. BROWN

**THE** Army Technical School at Langley Field is to be moved to Montgomery, which will bring about 15 planes, 50 officers and about 150 enlisted men to Maxwell Field, Montgomery. An observation squadron, with about twenty planes, has been located at Montgomery for some time.

**MONTGOMERY** has purchased 600 acres of land for a municipal airport.

**STERLING S. TATUM** has been appointed Birmingham traffic manager for the Gulf Airlines, Inc.

## MARYLAND AIR NEWS

By EDWARD JOHNS

**AERONAUTICAL** activities have slackened down to this more frigid season's usual pace in Baltimore, but that doesn't mean that props aren't turning over. Nor does it mean that plans aren't being formulated.

Bob Stewart, of the Monumental Aircraft, reports himself all overworked, and may be seen hurrying around the downtown section most every day carrying a little brown brief case all puffed out with papers. That is, the brief case is puffed out with papers, but so is Bob, for his pockets are full, too.

Down at Logan Field, the Chesapeake Aircraft is doing jobs almost as numerous as ever but to a less dense gallery.

In the Richmond Market Armory the Air Corps, Maryland National Guard goes through its paces every Tuesday night. There are the many classes in rigging, motors, aerodynamics, armament, radio, observation, tactics and the range of subjects. Time is put in the air by those on flying status on Sundays or Saturdays. One plane a week is usually sent on a cross-country mission, carrying one officer and one enlisted man.

The Doyle Aero Corporation is busy with plans for placing the Oriole sport monoplane into production.

**A** NEW airport is being opened on December 15 in Kent County, near Chestertown, from which the Chesapeake Aircraft Company will operate.

**THE** new 3,000,000 candlepower rotating beacon on the roof of the Standard Oil Company of New Jersey building was formally presented to the city of Baltimore on November 15. Miss Katherine Black, seven years old, turned on the beacon for its first official lighting. In the evening, the light was presented to and accepted by the city at a dinner at the Emerson Hotel.

A 1,500,000 candlepower fixed projector, indicating the direction to Logan Field, is also located on the roof of the Standard Oil building. The rotary beacon has a 24-inch lens and uses a 1,000-watt lamp. It rotates at six revolutions per minute and projects a beam one degree above the horizon. The beacon was installed by the Standard Oil Company of New Jersey.

**SINCE** the office building of Black & Decker Mfg. Company is on a direct line with Logan Field, Baltimore's airport, the company has painted an airplane marker on its roof to guide airplanes to this field. This marker is 115 feet long and 8 feet high.

**THE** Aero Club of Maryland at Baltimore, which conducts a school of flying instruction at City Line Airport, recently took possession of a three-story building at 2116 Maryland Avenue, where it will establish clubrooms. In addition to flying instruction, the club has organized a ground school course.



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## NEW YORK AIR NEWS

**F. N. DAVEY** has been appointed vice president of Barber and Baldwin, Inc., aviation insurance underwriters. Mr. Davey, who for the past six years has specialized in aviation insurance, will assist agents and brokers in handling aviation insurance.

**GEORGE F. WHEELER** has joined the staff of Black and Bigelow, Inc., air transport engineers. Mr. Wheeler, who was an Army aviator during the war, was an engineer for Pan American Airways, Inc., previous to his connection with Black and Bigelow.

### The New York Aviation Show

**MORE** than fifty aircraft companies and nearly twice that number of accessory firms have applied for space at the New York Aviation Show, which is to be held at the Grand Central Palace, February 6-13. The exposition committee of Aviators' Post No. 743, American Legion, under whose auspices this show is being given, has had to acquire another floor at the Palace, in addition to the three originally leased, to take care of the exhibits. The committee also has arranged to use the 71st Regiment Armory if necessary.

Through an arrangement with the board of education, the airplane model contest, which is to be conducted in conjunction with the show, will include a borough-wide educational program intended to stimulate air-mindedness among students in the New York City schools. Elimination contests for the model planes will be conducted at one of the armories of the city. Models will be judged for the length of time they remain in the air rather than for the distance they fly.

Aircraft exhibitors who have signed contracts to exhibit at the New York Aviation Show are: Columbia Air Liners, Inc.; Moth Aircraft Corp.; The Swallow Aircraft Co.; Eastern Aeronautical Corp. (Ryan Brougham and Command-Aire); Crescent Aircraft Corp.; Gates-Day Aircraft Corp.; U. S. Aircraft Co. of New Jersey; Bourdon Aircraft Corp.; Brunner-Winkle Aircraft Corp.; Arthur La Roe (Alexander Eaglerock); Nicholas Beazley Airplane Co., Inc.; Cessna

Airplane Co.; Stinson School of Aviation; Arrow Aircraft & Motors Corp.; Thomas D. Neelands, Jr., Distributor (Travel Air); Buhl Aircraft Corp.; Mill Basin Aircraft Co.; Spartan Aircraft Co.; Air Associates, Inc.; Tide Water Oil Co.; Ideal Airplane & Supply Co.; Sidney Blumenthal & Co., Inc.; National Aero Corp.; Norman W. Henley Publishing Co.; Airway Age; Brownback Motors, Inc.; Guaranteed Aircraft Hangars; Oakite Products, Inc.; American Aeronautical Corp.; Selley Manufacturing Co.; U. S. Model Aircraft Corp.; Mt. Carmel Mfg. Co.; Edgar T. Wards Sons Co.; Continental Motors Corp.; American Bleached Goods; E. H. Holmes & Co.; Hamilton Aero Mfg. Co.; Texas Pacific Coal & Oil Co.; Harwen Products Corp.; Rand McNally & Co.; National Air Pilots' Assn.; Wright-Tuttle Aircraft Motors; Bunnell Aircraft Corp.; Air Travel News; Broadfield Toy Co.; Grolier Society; Paramount Welded Aluminum Products Corp.; American Aviator Magazine; Popular Aviation Magazine.

Rex F. Gilmartin is chairman of the Post exposition executive committee.

The general committee includes Hon. Harry S. New, Postmaster General of the United States; Hon. William P. MacCracken, Jr., Assistant Secretary of Commerce for Aeronautics; Governor-elect Franklin D. Roosevelt; Maj. Gen. Robert Lee Bullard; Maj. Gen. James E. Fechet, Chief of the United States Army Air Corps; Rear Admiral William A. Moffett, Chief of the Bureau of Aeronautics, U. S. N.; Senator Royal S. Copeland; Congressman F. H. LaGuardia; Maj. Gen. William Weigel; Col. Lemuel Bolles; Col. Walter De Lamater; Col. Harold E. Hartney, former commanding officer of the First Pursuit Group, A. E. F.; Maj. George A. Vaughn, second American ace, Emmanuel Cohen; William C. Heppenheimer, president of the Trust Company of New Jersey; Maj. William J. Hammer, assistant to Thomas A. Edison; Capt. Eddie Rickenbacker, first American ace; Lieut. Thomas B. Mulroy, U. S. N. R., chief engineer of the Byrd Expedition to the Antipodes; William Randolph Hearst; Hon. George J. Ryan, president of the Board of Education of New York City; Hon. John Boyd Thacher, II, mayor of

Albany; Dr. Frederick L. Hoffman; Clarence D. Chamberlin; Bernard Gimbel; James Kimball, meteorologist of the United States Weather Bureau; Dr. Wilbur W. White; T. A. Dwyer; and Andrew H. Dykes, president of Rotary International.

**AT** a meeting of press representatives and men from the aeronautical industry held at the factory of the E. W. Bliss Company at Brooklyn, New York, on December 13th, Captain C. J. G. Bartlett, representative of the Bristol Airplane Company, Ltd., gave a brief talk on the well known Jupiter aircraft engine.

E. W. Bliss & Company expects to have the first American made Jupiter finished by the end of January or the first part of February.

There are now 16 countries throughout the world manufacturing Bristol engines.

**THE** Brownback Motor Laboratories, Inc., has made an entire change in its operating personnel. The officers of the company are: C. H. Phelps, president; H. L. Brownback, vice president; and A. W. Rinke, secretary-treasurer. Theodore C. Phelps is general manager; Bronson H. Davis, assistant manager in charge of sales; and Abbott A. Lane, assistant manager in charge of production.

This company manufactures the Brownback radial engine. Mr. Brownback, who recently returned from Europe, has designed a new 5-cylinder 150 horsepower engine.

### A. S. M. E. Annual Meeting

**AT** the forty-ninth annual meeting of the American Society of Mechanical Engineers, held in New York City, the problems of aviation from the standpoint of both pilot and manufacturer were discussed.

A report on the progress made in aeronautics jointly prepared by Alexander Klemin, Rear Admiral W. A. Moffett, Archibald Black, Mac Short and N. N. Tilley was presented by the aeronautic division of the society. T. P. Wright, chief engineer of the Curtiss Aeroplane and Motor Co., and G. M. Bellanca, the airplane manufacturer, took part in the discussions.

(Continued on next page)

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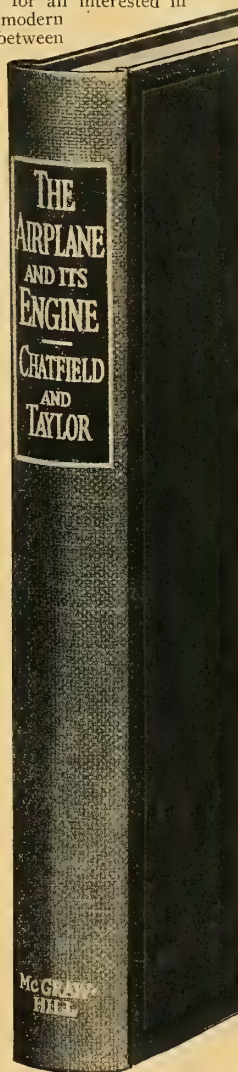
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(New York Air News continued)

**THE** Fairchild Airplane Manufacturing Corp. recently received an order from Interstate Airlines, Inc., of Chicago, for three 7-passenger Fairchild cabin monoplanes powered with Wasp engines. The Fairchild company recently filled a similar order for three planes, which Interstate Airlines will use on the new Chicago-Atlanta air mail line.

#### Avians Licensed in United States

**AS** the result of negotiations between Secretary W. P. MacCracken, Jr., and Sir John Broderick of the British Embassy in Washington, an arrangement has been made by which Avro Avians, sold in the United States by Air Associates, Inc., may be registered and licensed in this country. This is the first instance in which planes manufactured in England have been granted American licenses. The Department of Commerce has received assurance from the British Air Ministry that a reciprocal arrangement will be made by which American planes may be licensed in England.

#### Curtiss Flying Service Flying Fields

**THE** Curtiss Flying Service, Inc., is now operating five flying fields in the eastern part of the United States. They are Curtiss Field, L. I., N. Y., and fields at Portland, Maine; Bridgeport, Connecticut; Miami and Palm Beach, Florida, the latter two being adaptable for both land and seaplanes. The company has arranged to begin operations in eleven other cities in the spring of 1929; i. e., Boston, Syracuse, Buffalo, Cleveland, Detroit, Chicago, Toledo, Columbus, Indianapolis, Louisville, and St. Louis. Negotiations are now under way to establish service in Kansas City, Philadelphia, Washington, Denver, Los Angeles, San Francisco, and Minneapolis.

The Curtiss Flying Service handles the sales and distribution of Curtiss Robins and Fledglings, and Sikorsky Amphibions. Its operations in various localities include crop dusting, aerial photography, local taxi service, and cross-country flying.

The officers of the company are: C. S. (Casey) Jones, president; E. O. McDonnell and Cecil A. Elliott, vice presidents; J. A. B. Smith, secretary-treasurer; E. V. L. deBoisauvin, assistant secretary; and W. S. Leaycraft, assistant treasurer.

**THE** Guggenheim Fund for the Promotion of Aeronautics has purchased a Vought Corsair with a Pratt and Whitney Wasp engine for use in fog flying experiments it is conducting at Mitchel Field, L. I. The plane is equipped with special instruments for safety in blind flying.

**THE** Schenectady Airport uses a bill board as a guest book on which to list the names of noted fliers who have used the field. This board faces the main highway to the Adirondacks.

**SUNRISE FLYING CLUB** at Oceanside, L. I., is not only an active but a growing organization. Organized last March, the club now has a membership five times as

great as it originally had. A Challenger and a Waco-10 comprise the flying equipment of the club. Bert Shields, who has been flying for 13 years, has charge of instruction and is president. Ralph Vail is vice president; Ambrose Follmar, secretary; and John Yule, treasurer.

**THE** Pioneer Instrument Company is increasing its plant facilities by the construction of a new building in Brooklyn. The new building, a four-story structure to be located directly between the two units now occupied, will add fifty per cent more floor space for the company's manufacturing equipment.

**DURING** the Chicago show, the Curtiss Flying Service, Inc., made two large contracts for the purchase of aircraft and equipment. One order was for the delivery of 450 Curtiss-Robins; the other, for 100 Fledglings powered with Curtiss Challenger engines. In addition, 200 Challenger engines were ordered. This equipment will be used in the 29 cities where Curtiss Flying Service is establishing taxi service and training schools.

By the close of the exposition, Curtiss Flying Service had sold, in addition to the above, 16 Robins, 4 Sikorsky Amphibions, and one Ireland flying boat.

#### Valentine's Aeronautical Department

**VALENTINE & COMPANY**, manufacturers of Valspar and other aircraft finishing materials, has inaugurated an aeronautical department, headed by Mr. Langdon B. Valentine, vice president of the company. Mr. A. Irving Boyer, Jr., formerly with the British Royal Flying Corps, will be special representative.

The company is now supplying many of the important airplane manufacturers. Its products are on many of the planes which have become famous in the last few years, including Lindbergh's *Spirit of St. Louis*, Byrd's *America*, Chamberlin's *Columbia*, and Miss Earhart's *Friendship*.

The new aeronautical department will specialize on complete service to manufacturers, including laboratory development and expert practical demonstration work.



Langdon B. Valentine

#### Colonial Western's Record for the Year

**ON** December 17, 1928, Colonial Western Airways, Inc., completed its first year of operation. During that period the company's planes flew a total distance of 165,000 miles and carried a total of 55,062 pounds of mail and 1,295 passengers,—and this without the loss of a single ounce of mail or injury to a passenger.

**THE** General Aviation Co., Inc., of Syracuse, sent three representatives to the Chicago show last month,—G. W. Hoyt, vice president and general manager; M. S. Hutchinson, sales manager, and Fred T. Glynn, chief pilot. While in Chicago they made an arrangement with Command-Aire, Inc., of Little Rock, Ark., by which General Aviation Company is to distribute Command-Aire products in the state of New York outside the metropolitan area.

As New York co-distributor of Stinson planes, the company has sold five Stinson Juniors since the first of October. The company also runs a flying school, operates airports, and does commercial flying.

**THE** Consolidated Instrument Company is supplying altimeters, air speed indicators, tachometers and compasses for thirty-four Curtiss Falcon planes which have been purchased by the Army Air Service of Chile, South America. All the calibrations on these instruments will be in Spanish. This is one of the largest foreign military orders for instruments ever received in this country.

**R. R. RENNEE** has been appointed general manager for Air Transport Equipment, Inc. He will cover the eastern section of the United States.

**THE** Fiscal Service Corporation is handling all publicity and public relations for Colonial Air Transport. The president of the company is Capt. H. H. Railey, who was European manager for the transatlantic flight of Amelia Earhart. Capt. Railey is also acting as Commander Byrd's personal representative during the latter's absence in the Antarctic.

**BY** a recent arrangement with the Keystone Aircraft Corp., Cox and Stevens of New York, naval architects and yacht brokers, are to sell Loening amphibians and Keystone seaplanes in the United States. Robert P. Huntington is head of the aviation department of Cox and Stevens.

**SPECIAL** night flights over New York City are being offered by Colonial Air Transport. The fifty-mile flight offers an opportunity to see New York by night. Passengers are transported in Royal Blue Line buses from the McAlpin Hotel, through the Holland Tunnel, to the Newark Municipal Airport, where they board a trimotored all-metal Ford plane.

The plane carries fourteen passengers and may be chartered by arrangement with the Colonial office.

(Continued on next page)

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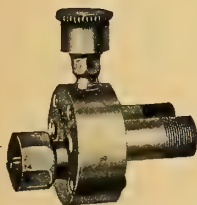
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"THE NON-TECHNICAL READER will find an opportunity to obtain a clear understanding of the theory of mechanical flight about which there is so much popular confusion" wrote Colonel Thurman H. Bane, former Commanding Officer at McCook Field, when he finished reading this new book. Written by the designer of airfoils used on most successful planes both in Europe and America, this book will give you a clear understanding of the fundamental reasons why an airplane flies, why it is stable or unstable, controllable or uncontrollable in various attitudes and condition—in short "why an airplane does what it does." Its explanations are simple but absolutely authentic, it will give you information that you have always wanted whether you are a veteran or a beginner.

#### Praised by Experts

Though it is only a few months since **Elements of Aviation** was first published it is already acknowledged as the year's outstanding book on aeronautics. Leading flying schools are buying it for their students; famous aviation experts endorse it—they say it contains just the information about aviation that everyone should have. Read these typical opinions:  
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Clark is a competent engineer and his statements can be accepted as a fair analysis of the subject."—Sherman M. Fairchild, President, Fairchild Aviation Corporation.

"Those looking for something worth while to read in regard to the science of aviation, will find in this book the right medium to obtain the fundamental knowledge."—Erik H. Nelson, Boeing Airplane Co., member of the Army's famous Around-the-World flight.

### Other Recent Books

#### "Aircraft Float Design"

by Capt. Holden C. Richardson (C. C.) U. S. N.; Chief, Design Section, Bureau of Aeronautics. 111 pages, 43 illustrations, Price \$5.00.

THIS BOOK is just off the press. It gives aircraft designers and students of aeronautical engineering information that they have long wanted on a phase of design that is of constantly growing importance. Aircraft float design requires the combination of the arts of naval architecture and of aero-architecture to produce floats that will be both seaworthy and airworthy. In many respects these demands are conflicting and floats to be successful must be designed with a recognition of the influence and importance of the various factors based on the results of constant checking of results shown in actual operation. The book is based on the author's sixteen years experience in design, construction, test, and operation of seaplanes, and on data obtained from other leading authorities both in America and Europe.

#### "Practical Flying"

by Major Byron Q. Jones, Army Air Corps. 210 pages, 6 illustrations, \$3.00.

EXPERIENCED AIRMEN enthusiastically endorse this new book by a veteran Army flyer and instructor—they say it will save many crashes and lives. **Practical Flying** answers the questions about airplane operation that are asked by those who are interested in aviation whether as prospective pilots or as passengers. Describes all the parts of a plane, instruments, etc.; maneuvers in the air; and explains technical expressions and slang terms. Covers practical subjects like: the most useful instruments for each class of flying, particularly "blind" flying; why a magnetic compass spins during fog flying; "dead stick" landings; causes of crashes during take-offs and turns for landings; how to recognize stalls in time and how to get out of them easily; suggestions for progressive lessons right up to the license flight, etc., etc.

#### "Engineering Aerodynamics"

by Lieut. Walter S. Diehl, (C. C.) U. S. N.; Scientific Section, Bureau of Aeronautics; Member of Aerodynamics Subcommittee, N. A. C. A. 282 pages, 159 illustrations, \$7.00.

PRACTICAL INFORMATION on aerodynamics, presented in forms suitable for direct application by aircraft designers and advanced students of aeronautical engineering. Large amount of data is condensed in working diagrams and equations, many important calculations are illustrated by practical examples. Shows how modern theories of lift and drag are applied in everyday design problems. Gives methods for designing control surfaces; explains advantages and limitations of airplane model tests and shows how data are interpreted. Gives detailed methods for calculating and estimating performance; shows how performance tests are made and how the observed data are reduced to standard conditions etc., etc. About two-thirds of the material this book contains has never before been available in printed form.

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(New York Air News continued)

### Exchange Club Progress Dinner

THE Progress Dinner of the United Business Interests to the Aviation Industry will be held January 29 at the Hotel Commodore, New York City, under the auspices of the Exchange Club. This dinner is a part of the extensive program of the National Exchange Club to promote aviation.

It is estimated that more than 2,000 business men, aviation executives, transportation experts, pilots and public officials will attend. Should any profit accrue from the dinner, it is to be devoted to charity.

Among the associations which have pledged assistance are: Merchants' Association of New York—Willis H. Booth, president; Chamber of Commerce of the State of New York—Albert C. Lord, aviation committee; Aeronautical Chamber of Commerce—Frank A. Tichenor, *Aero Digest*; Daniel Guggenheim Fund for the Promotion of Aeronautics—Harry F. Guggenheim, president; Broadway Association—S. E. Lester, vice president; Chamber of Commerce of the Borough of Queens—L. C. L. Smith, president; United States Department of Commerce—James F. Hodgson, District of N. Y.; New York Board of Trade—W. J. L. Banham, president; Maritime Association of the Port of New York—J. P. Magill, special representative; New York State Aviation Conference—Charles G. Hanna, president, mayor of Syracuse; State Joint Legislative Committee on Aviation—Sen. J. Griswold Webb, chairman; Forty-second St. Property Owners' and Merchants' Association—George W. Sweeney, president; Park Avenue Association—Charles Louis Sicard, president; Thirty-fourth Street Association—Thomas Mason, secretary; Long Island Chamber of Commerce—William H. Ross, president; Brooklyn Chamber of Commerce—Chas. H. Colvin, chairman airport committee.

The following are the members of the general committee for the dinner: C. B. Ames, vice president of The Texas Co.; W. W. Atterbury, president of the Pennsylvania R. R.; Bruce Barton, president, Barton, Durstine & Osborn, Inc.; James Warner Bellah, author and war aviator; John McEntee Bowman, president of Bowman Biltmore Hotels Corp.; Peter J. Brady, president of the Federation Bank & Trust Co.; Dr. Elmer E. Brown, chancellor of New York University; Maj. Gen. R. L. Bullard, Rtd. president, National Security League; Julius Henry Cohen, attorney; Barron Collier, president of Barron G. Collier, Inc.; Dr. Royal S. Copeland, U. S. Senator from New York; Robert E. M. Cowie, president American Railway Express Co.; Patrick E. Crowley, president of the N. Y. Central Lines; Edward P. Curtis, Eastman Kodak Co.; Hon. F. Trubee Davison, Assistant Secretary of War; Joseph P. Day, president, Joseph P. Day, Inc.; William T. Dewart, publisher of the *New York Sun*; Hon. Walter E. Edge, United States Senator from N. J.; Robert Erskine Ely, director of The League for Political Education; Maj. Gen. J. E. Fechet,

Chief of the Air Corps, U. S. A.; B. C. Forbes, editor of Forbes Magazine; E. M. Herr, president Westinghouse Electric & Mfg. Co.; Gilbert T. Hodges, president, Advertising Club of N. Y.; Dr. Frederick L. Hoffman, statistician, Prudential Ins. Co.; Hon. Leonard S. Horner, president of Niles-Bement-Pond Co.; G. H. Ingalls, vice president, New York Central Lines; Hon. W. Frank James, Congressional Com. on Military Affairs; Rear Adm. L. M. Josephthal, commanding New York Naval Militia; Major William Kennelly, president, New York Athletic Club; Ivy Lee, adviser on Public Relations; Hon. H. Edmund Machold, attorney; James H. McGraw, president, McGraw-Hill Publishing Co.; George V. McLaughlin, president of the Brooklyn Trust Co.; S. Stanwood Menken, attorney; Hon. Nathan L. Miller, former governor of New York; Rear Adm. W. A. Moffett, United States Navy, Bureau of Aeronautics; Hon. A. Harry Moore, governor of New Jersey; George W. Ochs-Oakes, editor, Current History Magazine; Maj. Gen. John F. O'Ryan, president, Colonial Western Airways; Hon. Robert L. Owen, United States Senator from Oklahoma; George Palmer Putnam, G. P. Putnam & Sons, publishers; Dr. Frederick B. Robinson, president, College of the City of New York; George J. Ryan, president, New York Board of Education; Charles H. Sabin, chairman of board, Guaranty Trust Co.; Francis H. Sisson, vice president, Guaranty Trust Co.; Henry R. Stuphen, president, National Association Engine & Boat Mfrs., Inc.; Merle Thorpe, editor of Nation's Business and contributing editor of Collier's; Henry C. Von Elm, chairman executive committee, Manufacturers Trust Company; Hon. James J. Walker, mayor of the City of New York; F. Edson White, president of Armour and Company.

### Address to Air Enthusiasts

JAMES VINCENT FONEL, directing engineer of the Aviation Engineering School in New York, recently delivered a simple non-technical lecture to a group of young men who came to his school to "get into aviation."

Extracts from Mr. Fonel's talk are quoted as follows: "You can learn aviation only by application—it cannot be done overnight, in a week or in a month. Constant study of the rudiments of aviation, theory of flight, construction, finish and operation are all necessary subjects to be studied. No one has ever become a pilot or great aviator by simply dreaming about it. Work and sometimes privation, coupled with determination and the ability to stick through disappointments, are the requirements of young men today who would become the leaders of tomorrow.

"Unless," Mr. Fonel concludes, "the young man is willing to risk all these things, he might better forget aviation."

Captain Hosea Mohlar has recently been added to the teaching staff of Aviation Engineering. Capt. Mohlar has had many years of experience in design, construction and operation of aircraft.

## ALBANY AIR NEWS

By H. F. Wood

ESTABLISHMENT of a weather broadcasting system for New York state airways will be asked of the 1929 legislature, Senator J. Griswold Webb, chairman of the legislative committee on aviation, told members of the state aviation conference at a recent meeting in Albany.

Senator Webb also outlined a proposal for installing neon obstruction lights on all high tension lines throughout the state and a proposal for legislation to place all flying schools under the supervision of the State Board of Regents.

According to Senator Webb's plan for improved weather service, additional stations would be established at Little Falls, Ticonderoga, Plattsburgh, Lake Placid, Watertown, Poughkeepsie, Oneonta, Elmira, Hornell, Olean, Jamestown, Middletown and Malone. Upper air observations would be taken twice daily, at 9 a. m. and at 1 p. m., from these stations and reports submitted immediately to Gustave S. Lindgren, government meteorologist at Albany. Mr. Lindgren would tabulate the information for broadcasting at 10 a. m. and 2 p. m. from WGY and either WJZ or WEAJ.

Establishment of this system, already approved by the United States Weather Bureau at Washington, would cost the state a total of approximately \$50,000.

THE right of New York state cities to issue bonds for purchase of land and equipment in the development of airports is upheld in a decision handed down recently by the court of appeals at Albany.

This decision supports an act of the 1928 legislature permitting cities to float bond issues for this purpose and follows a taxpayer's action to restrain the city of Utica from issuing bonds to construct and equip an airport.

EUGENE P. ABBOTT, former immigration inspector at Ellis Island, has been assigned to the Albany airport to supervise enforcement of immigration regulations in connection with air traffic between Canada and the United States. In company with William Scott, customs inspector, he meets the plane coming from Montreal to Albany daily.

LESTER W. HERZOG, commissioner of public works, is planning to make the Albany airport available for either wheel or ski geared planes this winter by clearing and rolling two runways and leaving the remainder of the field uncleared. The runways will be marked with black flags and the edges streaked with oil.

FRANK J. AMBROSE, veteran commercial flier, has been added to the operating personnel of Canadian Colonial Airways, Inc., as reserve pilot stationed at Albany. He also is acting as pilot for the Albany Air Service, succeeding Joe James, who is now flying mail for Interstate Airways between Louisville and Atlanta.

# "How can I get into Aviation?"



Read this Answer from

## A World Famous Trans-Atlantic Pilot

AVIATION is waiting for no one! Too many millions of capital are already invested—the demand for air service of *every* kind is increasing too fast. Aviation demands men who **KNOW**. Men who can **DO**. Men who can step into the real jobs and command the real salaries. Landing fields, municipal airports, plane and equipment factories, air mail and passenger lines, service and sales organizations—all are leaping ahead in the fastest, most amazing development that any industry has ever known. In such racing, feverish activity, *where* is there any room for a man who has nothing to offer? An empty pocketbook is no drawback—but Aviation has no place, no patience, *no time* for empty hands or empty heads! Aviation is taking off for the greatest non-stop flight in history—and the men who will go along and climb to the top are the men with a foundation of **FACTS** under them.

### Walter Hinton

Walter Hinton was pilot of the famous NC-4, first plane to fly the Atlantic; he piloted the first plane from North to South America; he was first to fly to the headwaters of the Amazon. During the War he was a crack flying instructor for the Navy. Today—with a course that experts agree is the most complete and practical ever produced—Hinton is training keen-sighted men for the Big-Pay jobs in aviation.

#### You Must Be 16 or Over

To take an active part in Aviation you must be at least 16 years of age. If you are under 16, please do not ask for Lieut. Hinton's Book because it will not interest you.

### Get his FREE Book

This FREE Book is YOUR first step to Success. Take this step—send for this book—**NOW!**

#### You Don't Have to Fly; 40 Different Jobs on the Ground PA Y BIG Too!

To succeed in aviation—make **BIG MONEY**—you need not necessarily be a pilot. There must be many thousands of pilots, certainly. But for every plane that flies, there's an immediate need for trained men in more than *forty* different important jobs on the ground. Construction, motor and instrument experts—airport managers, service foremen, salesmen—all make *real* money. Some of them even bigger pay than pilots earn. But every last one of them must have the **FACTS**. Today's problem—YOUR problem—is to **LEARN** aviation quickly. And right there is where Walter Hinton is achieving the biggest success of his career.

#### Choose Your Job

(Here are a few  
of the 40)

Designer and Engineer, Pilot, Engine and Plane Mechanic, Rigger, Wire Worker, Electrician, Welder, Instrument Maker, Wood and Metal Worker, Draughtsman, Plane and Motor Inspector, Airport Operator, Radio Expert, Assemblyman, Aerial Surveyor and Photographer, Aerial Transport Manager, Salesman.

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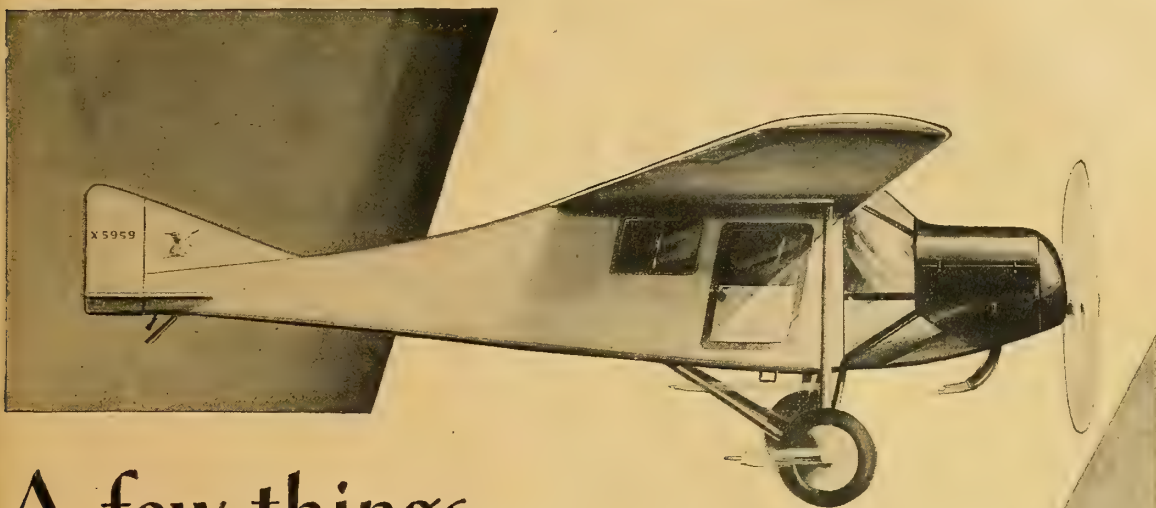


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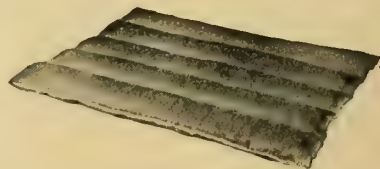


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*Aeronautics Department*

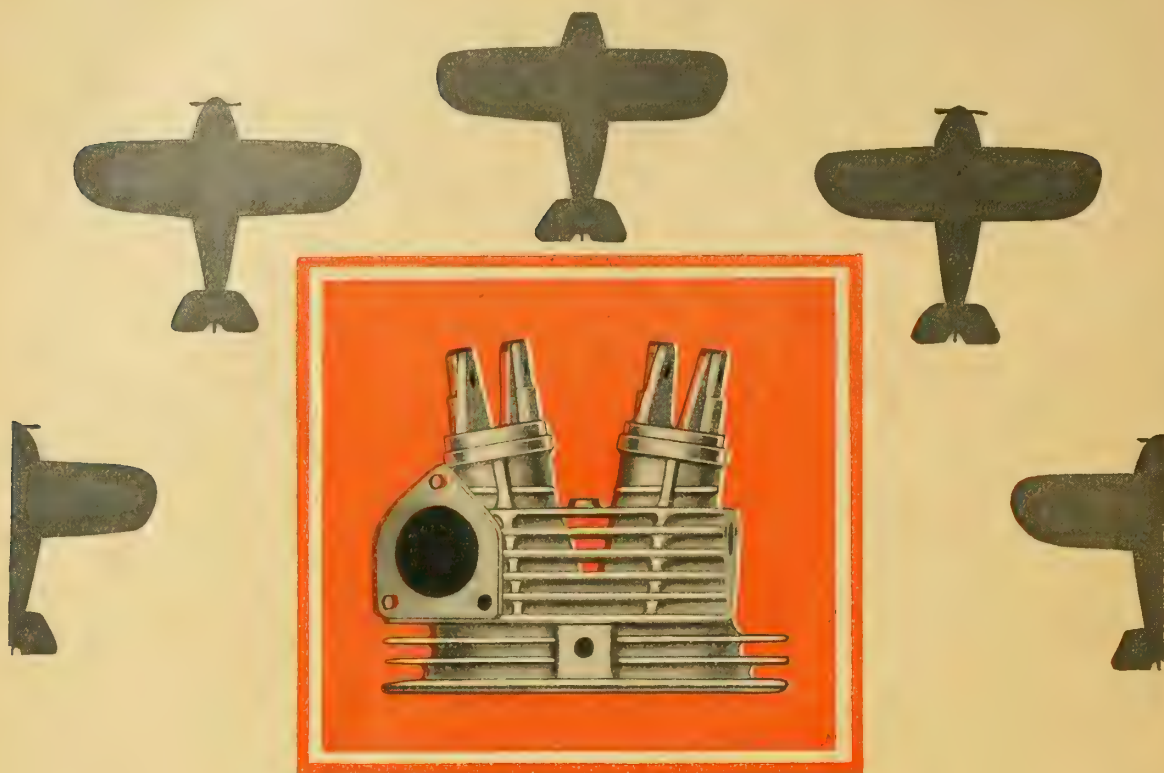
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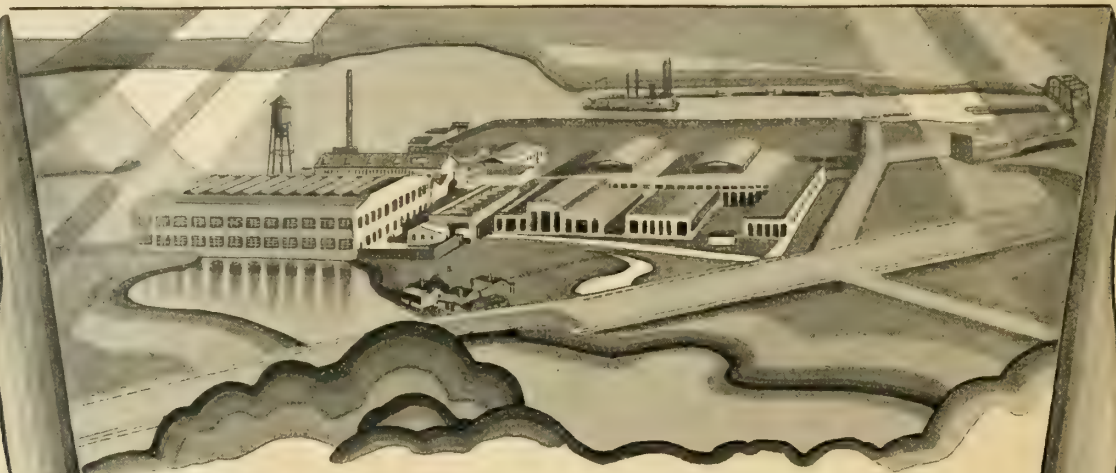
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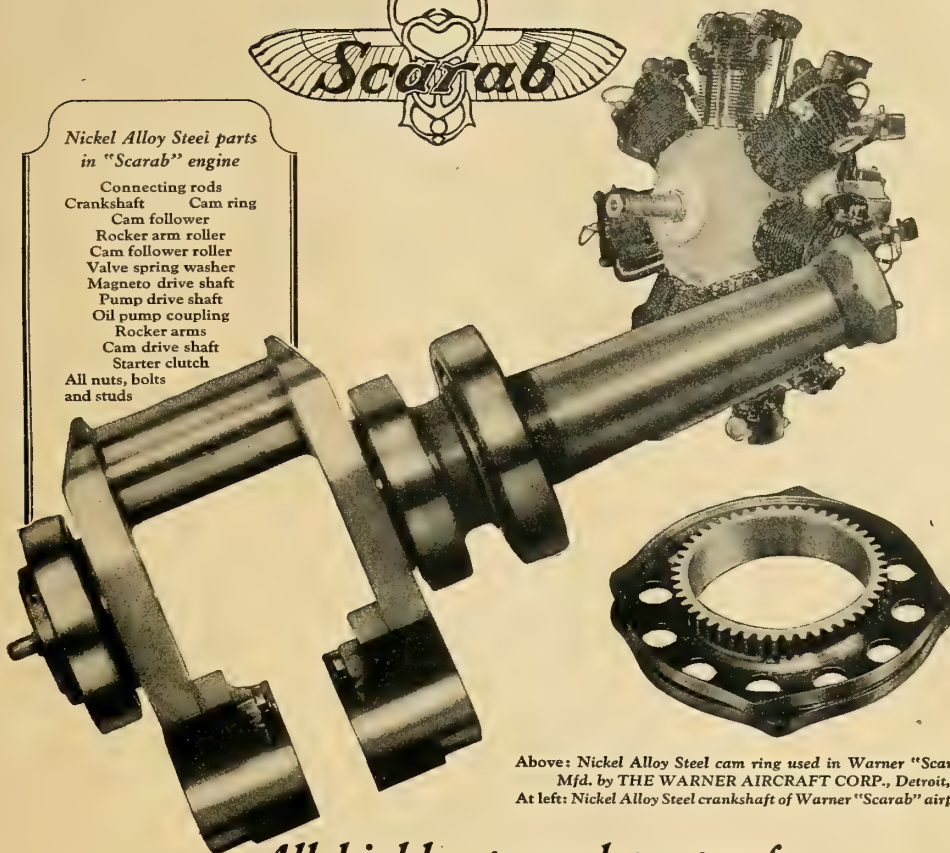




*Nickel Alloy Steel parts  
in "Scarab" engine*

Connecting rods  
Crankshaft Cam ring  
Cam follower  
Rocker arm roller  
Cam follower roller  
Valve spring washer  
Magnet drive shaft  
Pump drive shaft  
Oil pump coupling  
Rocker arms  
Cam drive shaft  
Starter clutch

All nuts, bolts  
and studs



Above: Nickel Alloy Steel cam ring used in Warner "Scarab" engine.  
Mfd. by THE WARNER AIRCRAFT CORP., Detroit, Mich.  
At left: Nickel Alloy Steel crankshaft of Warner "Scarab" airplane engine.

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The Warner Aircraft Corporation uses Nickel Alloy Steel for more than fourteen parts in the Scarab airplane engine. From crankshaft to bolts—wherever dependable strength must be secured without excessive

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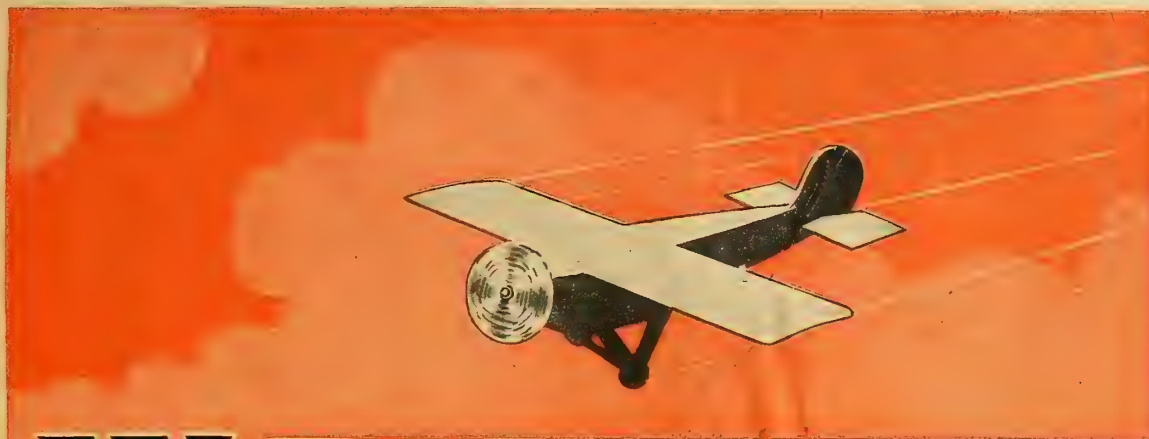
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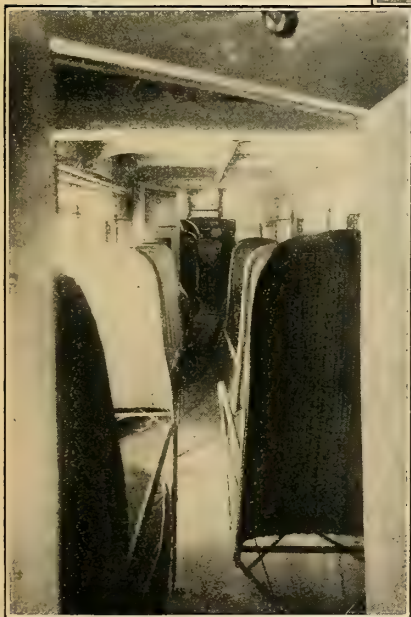
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forethought that made possible a new measure of power in reserve . . . and of the luxurious comfort of the great metal enclosed cabin.

Now when passengers from some of the outstanding railroads of the country leave the security of their steel coaches . . . to transfer to the sky . . . they do so with the confidence of knowing that in Hamilton Metalplanes are all the features of safety that modern skill and engineering has yet devised.

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# Hamilton



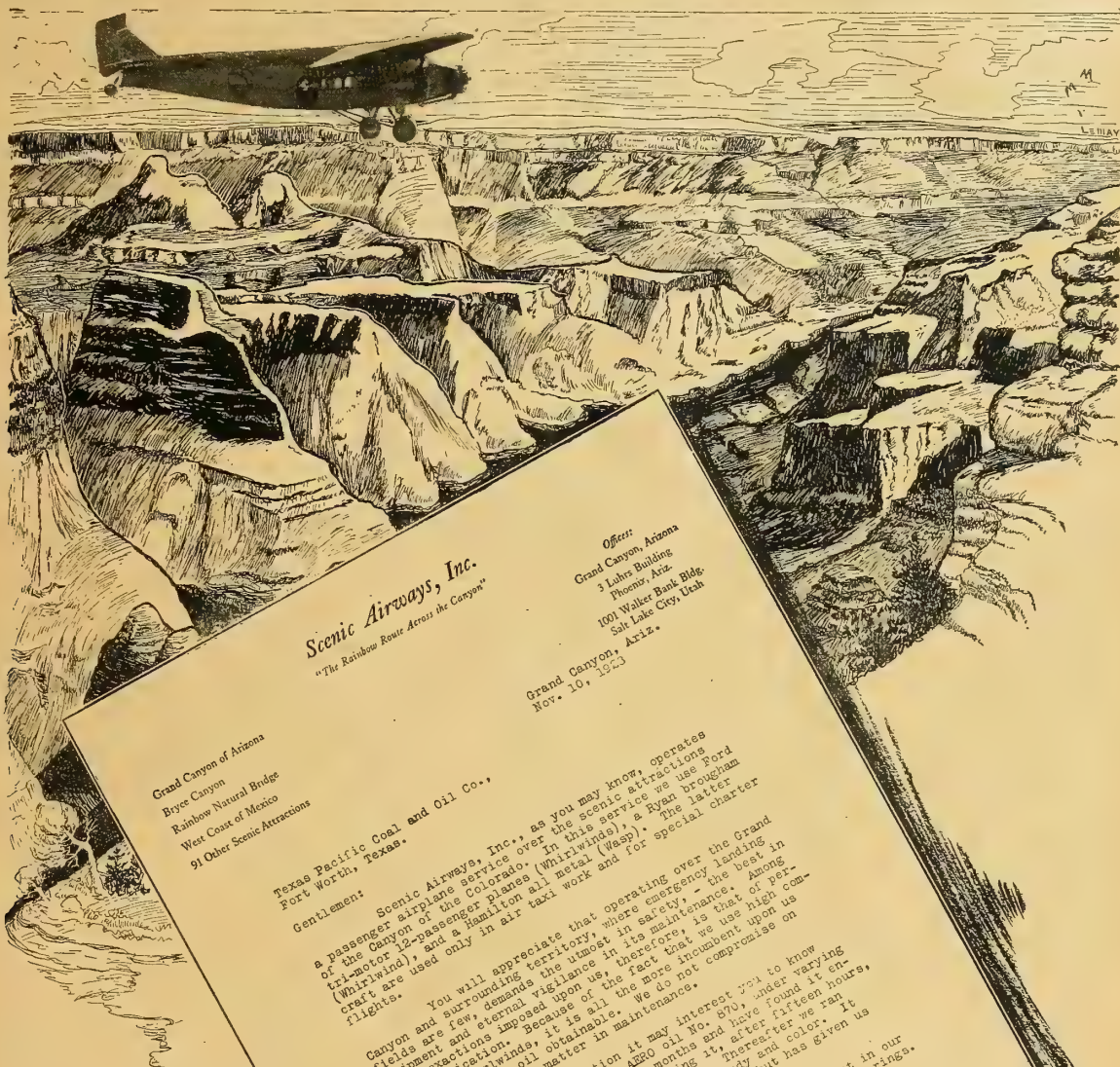
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 91 Other Scenic Attractions

Texas Pacific Coal and Oil Co.,  
 Fort Worth, Texas.

Gentlemen:

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You will appreciate that operating over the Grand Canyon and surrounding territory, where emergency landing fields are few, demands the utmost in safety, - the best in equipment and eternal vigilance in its maintenance. Among other exacting conditions imposed upon us, therefore, is that of perfect lubrication. Because of the fact that we use high compression Whirlwinds, it is all the more incumbent upon us to use the best oil obtainable. We do not compromise on this, or any other matter in maintenance.

In this connection it may interest you to know that we have used your TP-AERO oil No. 870, under varying conditions during the past six months and have found it entirely satisfactory. After draining it, after fifteen hours, we have found it too good to discard. Thereafter we ran it twenty hours and it still held its body and color. It not only meets the right specifications, but has given us splendid service under exacting conditions.

We are also using your rocker arm lubricant in our Whirlwind engines, both on push rods and rocker arm bearings. We have found this product also of high quality.

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*Lamar Nelson*  
 Lamar Nelson  
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must be yours if you seriously contemplate a career in the fascinating and profitable business of flying, just as it must be yours for your own safety if you intend to take up flying as a sport.

See, then, the features that make Parks Air College the finest and most completely equipped flying school in the United States—that have made it the largest Commercial Flying School in the country.

New production airplanes used exclusively—a fleet of 20 ships.

Only experienced and licensed Transport Pilots employed as instructors—12 of them to serve you.

Airplane, engine and navigation experts to teach you in the class room—the finest instructors that could be obtained from the ranks of the Army, Navy and University staffs.

Complete shop equipment, including Whirlwind, Caminez, Hispano-Suiza, Velie, OX-5, and other modern power plants.

Dormitories, cafe and recreation room for students, ample housing facilities for those who want to live away from the field, modern class rooms and shops—a plant that cost more than \$200,000—a flying field that is a favorite stop for cross-country pilots.

### If You Investigate

it's a foregone conclusion that you will decide to come to Parks Air College. You can't afford to do anything else. Remember, too, that despite its pre-eminence, Parks Air College training costs no more than training in an ordinary school.

If you want further information before making your decision, let us give it to you. Write for "Skyward Ho!" a fascinating, illustrated book describing Parks Air College and giving the reasons for its leadership. Here's the coupon, just below. Sign it and get it off in the next mail.

### And Incidentally

when you receive the catalog, pay particular attention to our promise of a job in the Parks organization to students who obtain their Limited Commercial Licenses. IT'S AN OPPORTUNITY WITHOUT PARALLEL IN AVIATION.



## PARKS Air COLLEGE Inc.

202-M Missouri Theatre Bldg., St. Louis, Mo.

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Send me "Skyward Ho!" please, with full details of your courses.  
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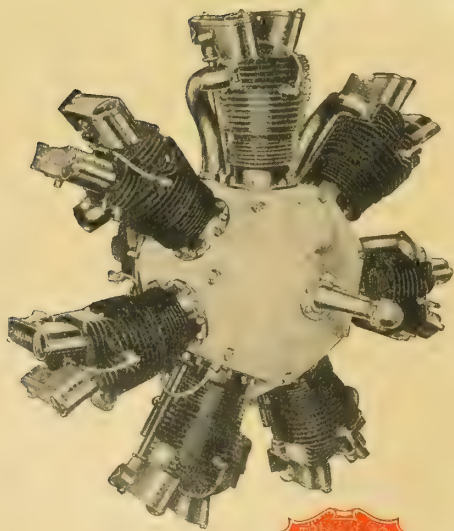




The minute testing of metals by photo-micrographic observations, direct microscopic inspection and checking of chemical, mechanical and thermophysical reactions...are routine in the Axelson Airplane Motor Division.



# No Hampering compromise will ever be tolerated in *Axelson Accuracy*



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The name Axelson upon the motor is a definite, tangible guarantee of sustained service. It is a symbol of our Pledge that the motor embodies the highest degree of quality in every hidden and unhidden part.

And to support this Pledge Axelson extends a factory and field service which is unquestionably as *advanced* in spirit as the Axelson Motor is advanced in design and trustworthiness.

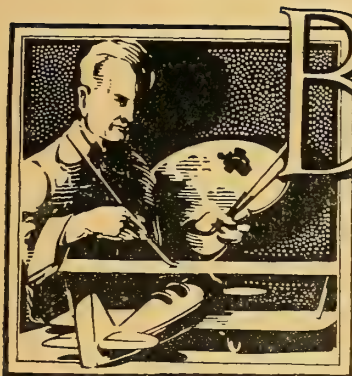
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Introducing a  
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# ★ THE ★ BERRYLOID FLEET



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It is Berry Brothers' hope that this series of color plates will be of real value to the aircraft industry. Certainly those who seek new and artistic color combinations will find it helpful.

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try and to the air-minded public that is fast learning to enjoy and properly evaluate airplane flight — our latest and most wonderful mode of transportation.

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AUSTIN is ready to hop at a moment's notice! A telegram, A phone call or letter will bring an Austin Airport Engineer, who is prepared to make the selection of a site for your proposed airport.

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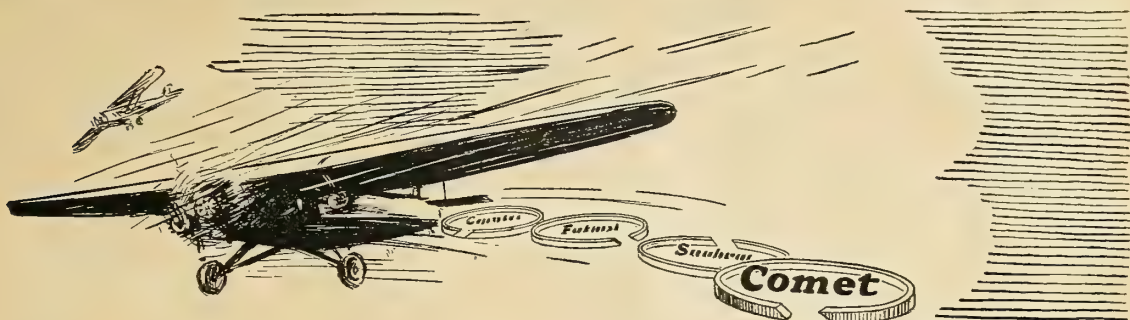
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**B**EFORE each of the above great companies manufacturing airplane motors adopted U. S. Hammered Piston Rings, it subjected the latter to gruelling tests that were even more severe than those which they received on the epochal flights mentioned below.

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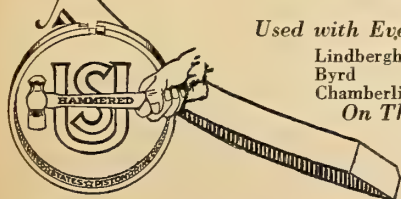
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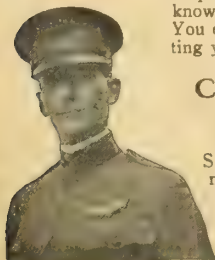
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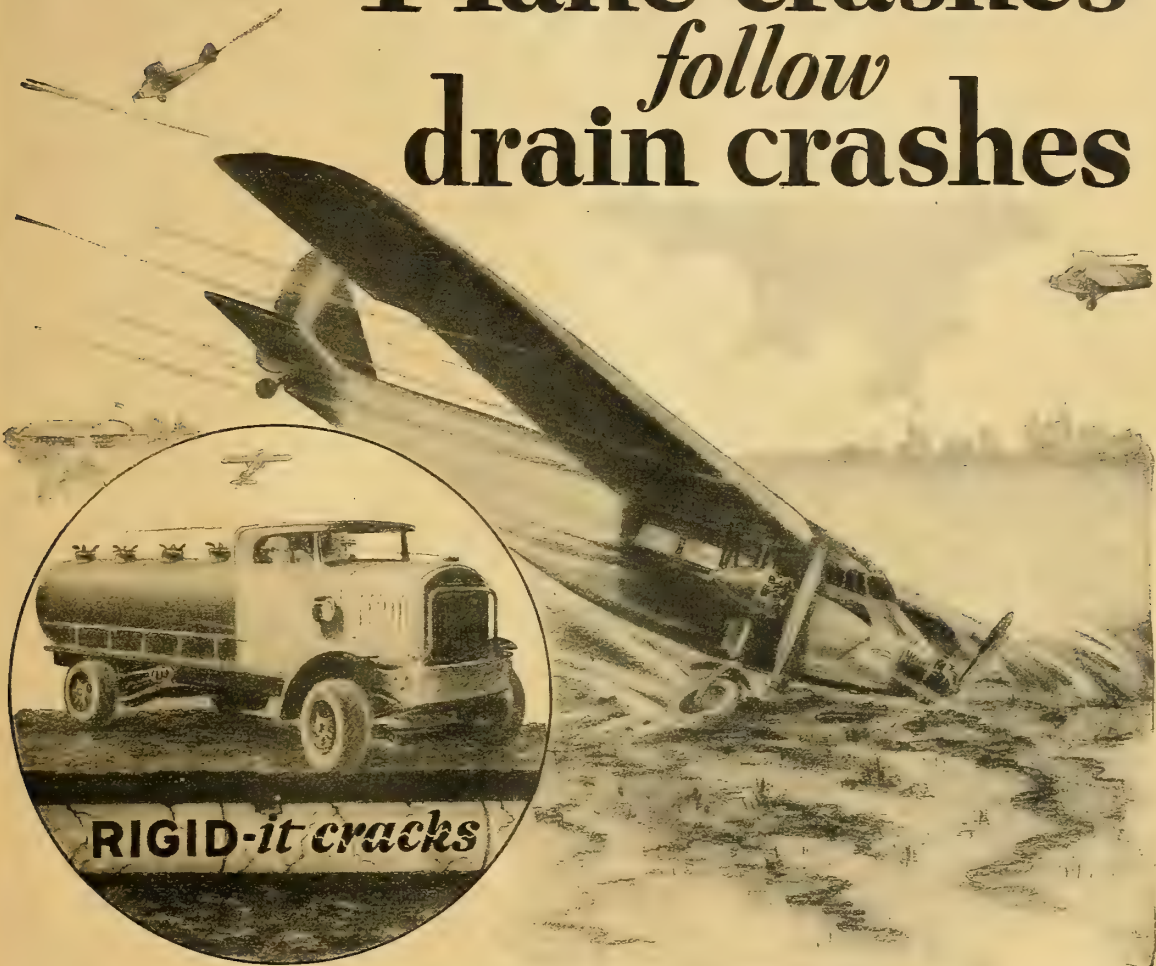
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# Plane crashes *follow* drain crashes



**A**IRPORT service is a real test of drains. Gasoline trucks bump over them, rollers crush the ground above them, airplanes land with 10-ton force.\* It is important that drains give continuous service, for any interruption means impounded water, a soft field, dangerous accidents. Water must be removed quickly to prevent formation of dangerous soft spots.

For this reason engineers and airport

officials are turning to Armco perforated iron pipe for airport drainage. This flexible pipe will not break from impact. Its one-piece, strongly connected construction eliminates possibility of disjoining. You *know* you have continuous drainage.

Write today for complete information; no obligation.

\*Force estimated from figures by U. S. Dept. of Commerce.



Armco culverts and drains are manufactured from the Armco Ingot Iron of The American Rolling Mill Company and always bear its brand.

ARMCO CULVERT MANUFACTURERS ASSOCIATION, Middletown, Ohio

## ARMCO *perforated* PIPE

© 1929, A. C. M. A.

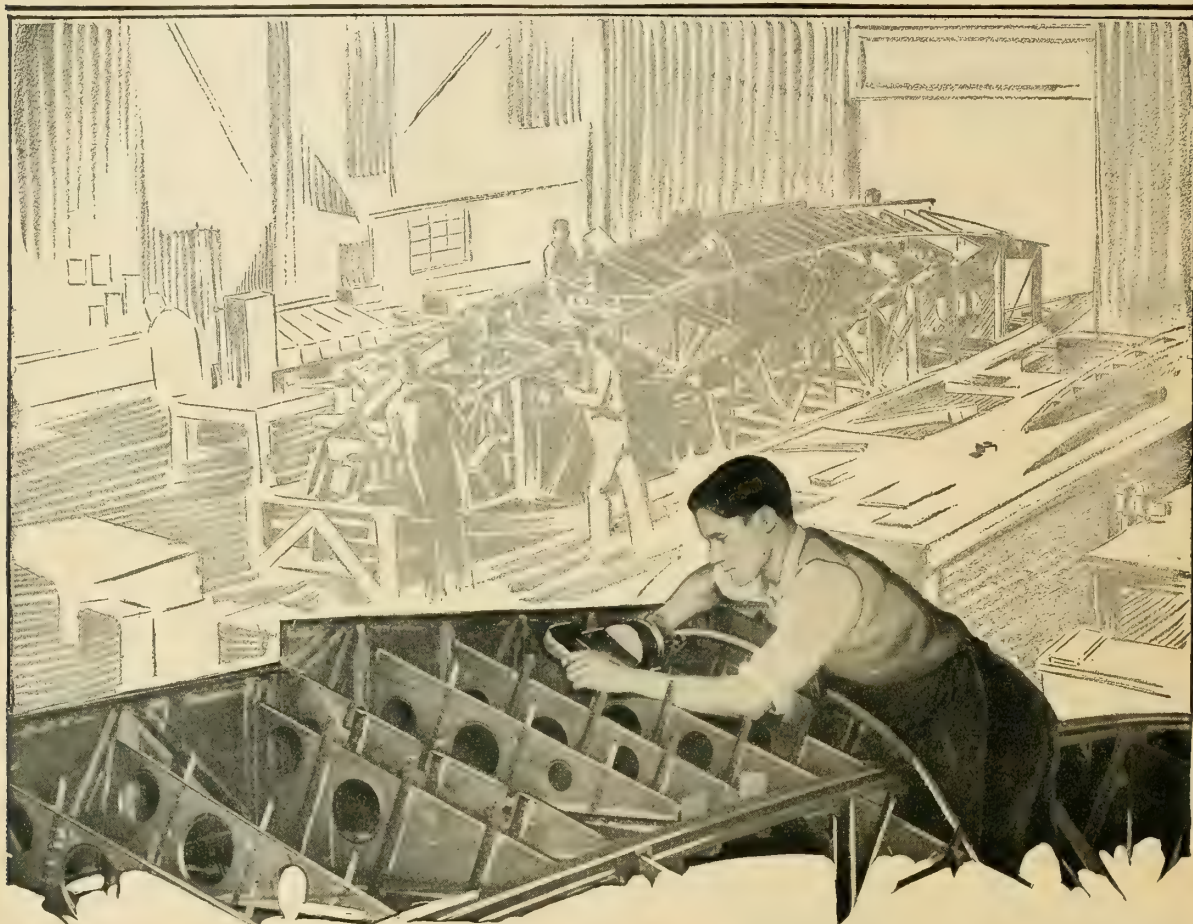
*Use flexible pipe—it cannot break*



FIRST AROUND



THE WORLD



## *Speeding Production Yet Increasing Quality*

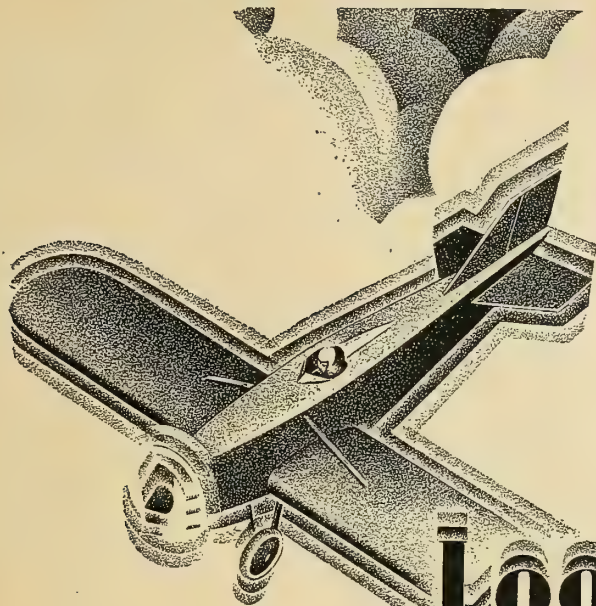
To speed up production, yet to employ production methods that will increase quality production rather than merely equal the older methods, Douglas is ever seeking newer and finer production machinery.

The new 200,000 square foot Douglas Factory, and the equally spacious additional unit soon to follow, brings into aircraft manufacture the finest machinery and production equipment obtainable.

Illustrative of the fact that Douglas early realized the tremendous importance of modern production methods is the fact that years ago Douglas discarded rivet hammers in the Metal Department, replacing them with rivet squeezers. It is of importance that rivet hammers tend to make rivet heads brittle.

This same substitution of better production methods prevails in every department of the Douglas Factory. As rapidly as new production methods are developed and *proven* Douglas stands ready to accept them and thus by improving the details of production emphasizes the fact that *Douglas Means Dependability*.

DOUGLAS  
AIRCRAFT CO.  
INCORPORATED  
*Santa Monica California*



# Look out! Look out!

## *look out you're rocking the boat!*

**B**ITTER days require better gloves. Gloves that are warm, you understand, but not too heavy. Gloves that won't be "fumbly" — that won't interfere with your sensitive touch on the joy-stick.

Having been in ships rocked by pilots with too thick a feel on the stick—the men who design Spalding Aviation Equipment know the inside and the outside of glove requirements.

The glove illustrated here is a result of rocking experiences. It is a Black Leather glove and mitten combined, lined with electrified lamb fur. Patented hook-less fastener in gauntlet.

Such a glove will keep your hands warm, and yet allow easy finger movement—thus giving you the necessary light touch on the stick. And these gloves are priced at only \$20.00.

Spalding has, of course, a complete stock of flying equipment. See it at our stores carrying flying equipment—New York, Chicago, Detroit, San Francisco, and Wright & Ditson, Special Distributors, 344 Washington Street, Boston. Or clip the coupon for a free catalogue.



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## DR. G. L. BENNETT HELPS FINANCE YOUR FUTURE—

Dr. G. L. Bennett, one of the first licensed pilots, and founder of the famous Bennett System of Flying Instruction, has opened the door to aviation success to all ambitious men.

Your training for the greatest of all careers necessarily is extensive, but the Bennett time payment plan permits you to enroll immediately with a small down payment on any course, complete your training, helps you into a paying job, and enables you to pay balance of tuition after graduation when earning. No red tape. No delays. No unreasonable handling charges. Write for complete details.

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NO longer is it necessary to stress the tremendous opportunities waiting in the air—for the big rewards of aviation are forcefully apparent to all thinking men. The question is: "Where can I receive the best practical flying training?"

\*First—Every graduate of Bennett higher courses has passed all U. S. tests successfully, and is a licensed pilot. That's point one.

Second—All Bennett courses are conducted with one major object in view—to teach you to fly any ship **RIGHT!**

Third—Bennett training gives you a background of acquaintance which leads into the best rewards in aviation.

Fourth—Now, the Bennett time payment plan opens the door wide open to every

man to start his career in the air.

This famous system of flying instruction passes lightly over the non-essentials, but gives major attention to practical training—Complete mechanics experience on all motors, all phases of flying, aerodynamics, navigation and meteorology, taught by army expert. Students solo on Kansas City's new million dollar airport (illustrated above), one of America's finest. Receive more actual flying hours—more real personal instruction.

Four complete courses: Ground mechanics, Primary Flying, Limited Commercial and Transport Course which gives you 200 hours of solo and meteorology and navigation. Here you can prepare for your future in the air, **RIGHT!** Now enrolling spring classes.

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Please send your complete catalog of courses and details of time payment plan. I am interested in:

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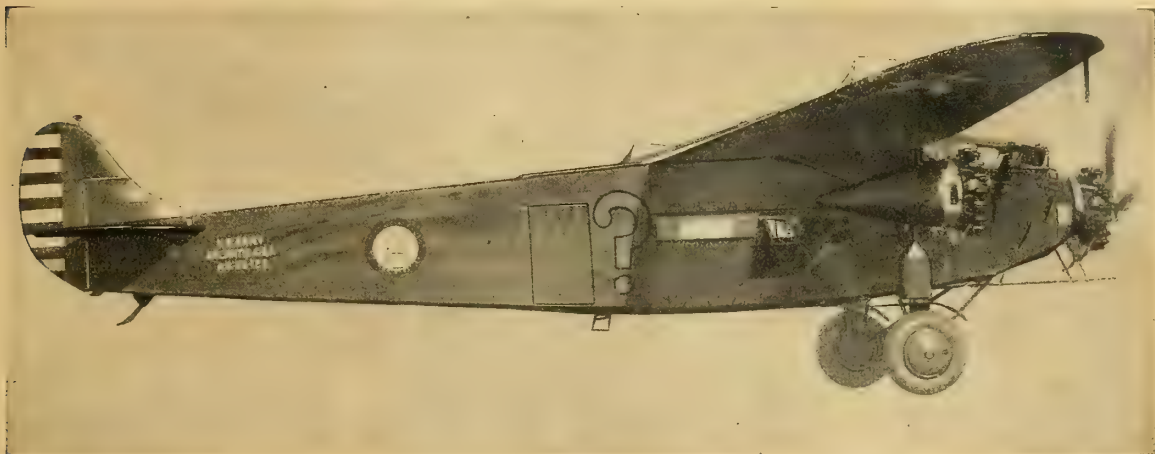
( ) Limited Commercial Course.

( ) Primary Flying Course.

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**Easy Pay Plan  
Start Your  
Career Now!**



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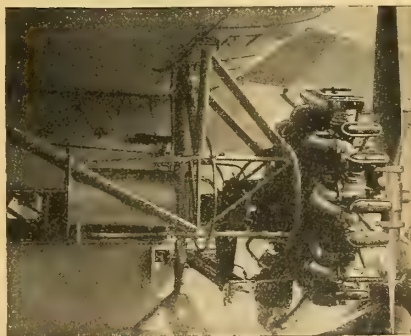
SIX and a quarter days of sustained flight! Surely, this is the supreme test! The world of aviation is discussing the Fokker Trimotor, *Question Mark*, as the greatest mechanical marvel ever made by man.

An argosy of the air with thousands of working parts, and every part passed this 150 hour test, untouched by human hands! The installations of power plant accessories, for example, involve a multitude of necessary details—oil pipes, fuel lines, electrical wiring, engine controls and mountings—any one detail of these can make or mar a flight.

The wonder is that, thanks

to the makers' experience and engineering skill, such a mass of intricate construction has been wrought into one unit so complete and so dependable.

Let any aircraft operator ask himself what plane other than a Fokker could have achieved



Starboard engine installation  
of Fokker C-2 Trimotor

such a demonstration of reliability. Again the construction, inherent stability, and fatigueless controls of the Fokker are confirmed by a record for endurance. Once more the many Fokker features, developed and refined during 18 years of airplane production, are established on a still higher level by this most remarkable flight in all aviation history.

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Lady Mary Heath

## England's "Lady Lindy" Praises The Aristocrat, America's Finest Small Plane

### *The Aristocrat*

#### *All That the Name Implies*

Many famous flyers say that the Aristocrat Three-Place Cabin Plane is the last word in safety, performance and ease of handling.

Elegant in appearance and comfortable in the coldest weather, it is the ideal all-purpose plane for all seasons.

**Make us prove it to you!**

#### *A Complete Line*

General Airplanes Corporation manufactures a complete line of commercial airplanes of advanced design, all conforming to the specifications of U. S. Army, Navy, and Department of Commerce, as well as the I. C. A. N.



HOTEL STATLER  
BUFFALO

December 19, 1928.

Mr. G. MacLean Gardner,  
General Airplanes Corporation,  
Buffalo, New York.

Dear Mr. MacLean Gardner:

I want you to be kind enough to convey to your company my gratitude for the loan of the "Aristocrat" for me to fly it to Toronto and back yesterday.

I am glad to see that you are filling the crying need for a really comfortable salon-car-like interior. It brings one to the end of even such a snow storm journey as we had yesterday, fresh and untired.

I was particularly impressed in flying the Aristocrat--my first small cabin plane--to find the ease of handling and good balance of the controls. You have succeeded in giving a very good range of visibility. I was amazed at its load carrying capacity--three people and all their kit; its low landing speed, and its lateral control at low speed.

When I come to Buffalo again I hope you can see your way to permitting me to borrow it again.

Sincerely yours,

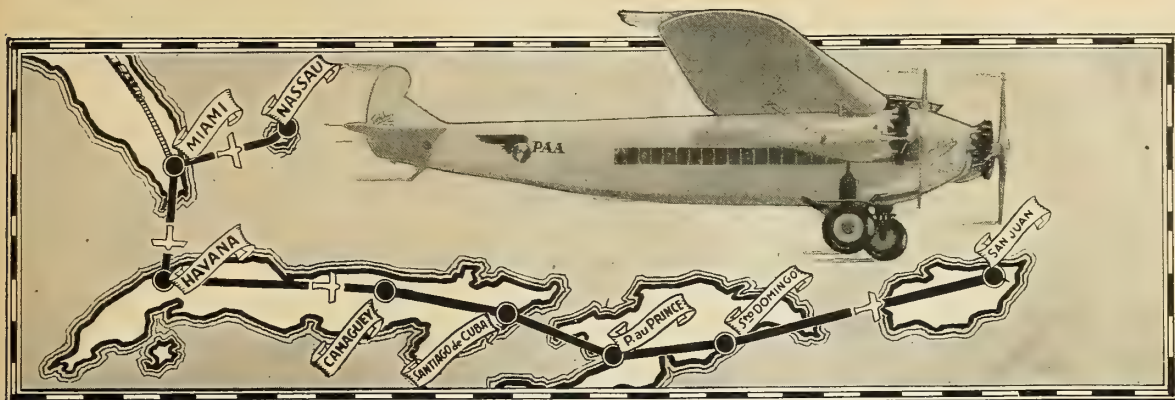
*Mary Heath*



**Dealers:** *Perhaps your territory is still open.  
Wire or Write for our Attractive Offer.*



**GENERAL AIRPLANES CORPORATION, 553 Abbott Road, Buffalo, N. Y.**



# Pan American Achievement

**A**FTER fifteen months of successful passenger-mail service from Florida to Havana, Pan American Airways, Inc., has inaugurated through rail-air service from the East and Middle West to the Indies.

It now takes another important step in developing international air transport by retaining Colonel Charles A. Lindbergh as technical adviser to Pan American Airways, Inc., and its affiliated operating companies, and also as consultant to Aviation Corporation of the Americas, the holding company.

Colonel Lindbergh will pass on all matters pertaining to routes, airports, equipment, and all technical matters relating to Pan American service.

## Speed With Safety

This action follows the Pan American policy of making safety of operation its first consideration. It has procured the most able technical advice; just as it has equipped its giant tri-motored Airliners with directional radio giving constant communication with two airports, furnished them with every safety device known to modern aviation, manned each with two veteran pilots and a capable steward. To qualify, senior pilots must have 2000 hours of flying time; junior pilots, 1000 hours.

While placing safety foremost, Pan American Airways, Inc., has had due regard for the modern requirement of speed. From the northern terminal at Miami, Airliners daily make the voyage to Havana in 2 hours and 15 minutes, saving an entire business day. Thrice weekly service from Havana to Port au Prince, Santo Domingo City, and San Juan clips 33½ hours from the former travel time. Thrice weekly service from Miami to Nassau covers in 2 hours the distance requiring sixteen hours by steamer.

Nor has passenger comfort been forgotten, as is shown by our operating agreement with seven great railroad systems. Through rail-air service to the Bahamas and all parts of the Indies has been inaugurated. The entire Atlantic seaboard and the great cities of the middle West are now offered for the first time a fast, unbroken-luxury journey to Havana and all parts of the West Indies.

## Combined Rail-Air Service

Six of the nation's finest trains daily carry passengers to Miami. Private motor cars convey arrivals to Pan American Airport, the first Rail-Air Terminal in America. Gigantic tri-motored Airliners wait to speed them on their way. Within one hour after arriving in Miami they are moving with speed and comfort toward the tropical islands.

Pan American Airliners present a revelation in travel comfort. Restful easy-chairs, flanking a wide central aisle, offer a view through full-vision windows. Mail and baggage have their separate compartment. Modern toilet facilities provide for passenger comfort. In short, the Airliners continue the luxurious service found on these excellent connecting trains.

From New York—39 hours to Havana and Nassau (making direct connections from Boston).

*Havana Special* Lv. 3:20 P. M.

*Palmetto Limited* Lv. 7:10 P. M.

*Florida Special* Lv. 8:35 P. M.

From Chicago and principal cities in Ohio and Michigan.

## Flamingo

From Chicago and St. Louis—44 hours to Havana and Nassau.

*Dixie Limited*

*Floridan*

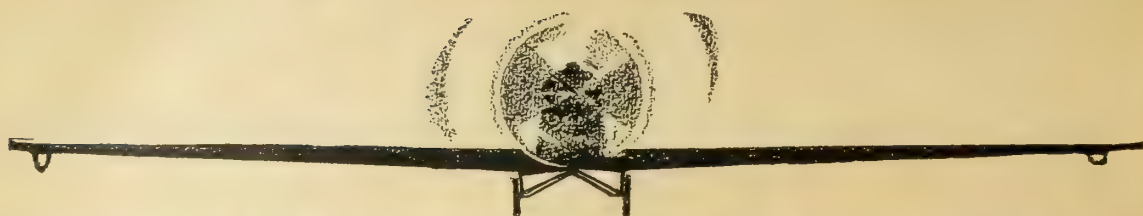
*Information, rates and reservations are available at 800 principal railway offices or at any office of Pan American Airways, Inc.*

# PAN AMERICAN AIRWAYS, INC.

122 E. 42nd Street, New York City







## WINNER OF INTERNATIONAL LIGHT AIRPLANE MEET



AKL25 WATER TYPE

The Aeromarine Klemm—AKL25 plane, known in Europe as the Klemm monoplane, was adjudged the most efficient general-purpose airplane of its type, in the recent International Light Airplane Meet held at Orly Aerodrome, Paris. Of the numerous light planes entered in the meet, only seven survived the rigid tests.

The efficiency of the competing planes was determined by multiplying the useful load carried by the speed in miles-per-hour, over a hundred and ninety-five mile course, and dividing the result by the total fuel consumption in pounds.

The trials which gave the AKL25 the highest total number of points scored by any plane, was based not alone on efficiency of operation, but included the consideration of such qualities as comfort — protection against turning over—time required to start engine—dual control—anti-fire protection—speed of dismantling and assembling plane—take off from muddy field and climb.

The result of this contest singularizes the Aeromarine Klemm—AKL25 — as the international winner—the proven light plane for pleasure and profit — particularly adaptable for owner-pilot operation and flying instruction.

For the complete story of the AKL25—the wonder-plane of two continents, write the



AKL25 LAND TYPE

### AEROMARINE ★ KLEMM ★ CORPORATION

PARAMOUNT BLDG. 44" ST. & BWAY. NEW YORK.



# SCHLEE *and* BROCK

*World and Endurance Flyers*

## CHOOSE LOCKHEED VEGA

*The plane that will carry the same pay-load  
farther, faster and with less fuel expenditure.*

**F**ROM a background of long experience, careful observation and constant comparison—Schlee and Brock have chosen Lockheed aircraft for distribution. Their choice is based on a studious and careful analysis not only of the Lockheed-Vega itself but of competitive aircraft as well—a comparison in which the Lockheed, in their opinion, is *outstanding* for its performance and offers today a utility *well in advance* of present aircraft standards.





# THE BEST SHIP I EVER FLEW—



*The Lockheed has a trimness and cleanliness of line with lack of parasite resistance seen only in the high speed and costly racing types. It is this beauty of line that enables the Lockheed to carry the same pay-load farther and faster with less fuel expenditure than any of the present day types.*

## HAS WON RECORDS GALORE: Holds Both Trans-continental Speed Records; Was First Over North Pole and Chosen by Wilkins for South Pole Expedition

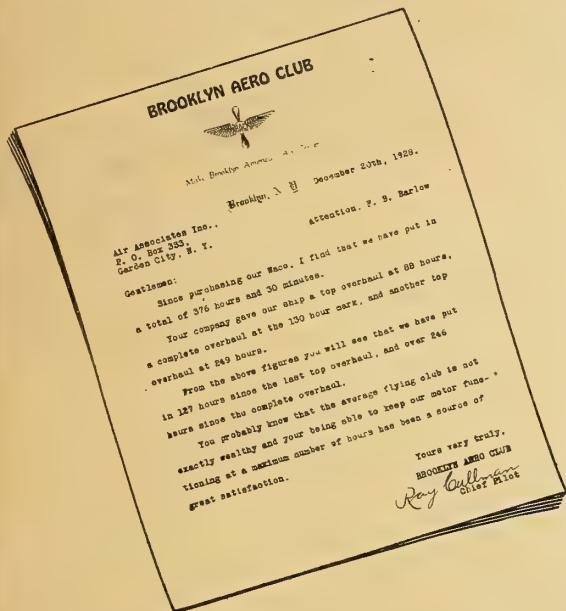
THE famous Lockheed-Vega Wasp motored plane, piloted by Art Goebel (left) and Harry Tucker (right), was the only ship to complete the flight from New York to Los Angeles during the recent Air Derby (time 23 hours and 45 minutes—excluding one stop at Phoenix, Arizona, of 35 minutes). The Yankee Doodle established speed records both ways across the Continent as well as numerous other new records in speed and utility.



ACROSS 2,200 miles of frozen Arctic waste—Capt. George Wilkins and Lieut. Carl Eielson on April 15, 1928, flew a standard production Lockheed-Vega cabin monoplane in a hazardous non-stop flight of 20½ hours—from Point Barrow to Spitzbergen. Said Eielson: "The Vega flies 'hands-off'—its ease of handling and comfort placing it in a class by itself." Because of its outstanding speed and power in the North Pole dash, Wilkins chose it for his South Pole Expedition.

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as well as another.....



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Dope Thread  
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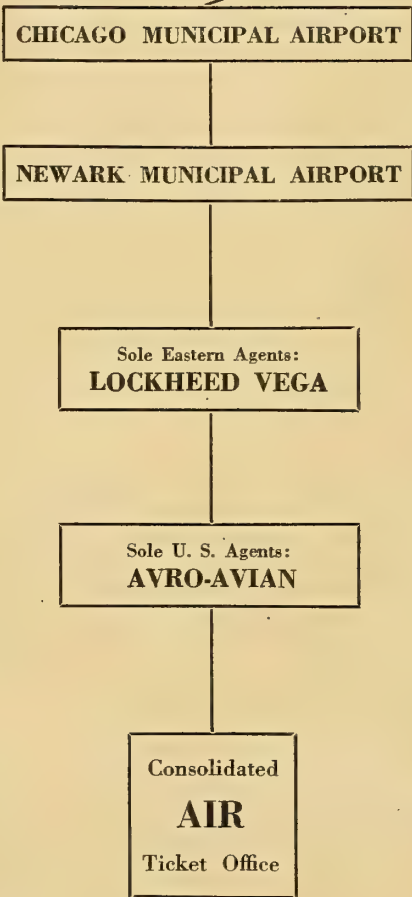
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of all Supplies and Equipment**

*Write for Price List*

**AIR ASSOCIATES, Inc.**  
Curtiss Field, Garden City, L. I.



.....at Curtiss Field and will  
pay in 1929 at.....



New York





## Ford-trained pilots for Ford planes

WE BELIEVE that safety is the foundation on which the success of commercial aviation must be built. In building the Ford tri-motored, all-metal transport monoplane, we give first consideration to safety in its design and structure. Speed, comfort, maneuverability, climb, general performance, efficiency—all these have their proper place and receive the consideration they deserve. But in our opinion none of them supersedes safety in importance.

Aviation has not reached the stage, admittedly, where the human element in flying can be ignored or even regarded with indifference. We make the Ford plane as self-reliant as possible. But we are the last who would claim that the Ford plane, of itself, assures safe flight. A thoroughly trained and competent pilot is essential. And he must be experienced on the particular type of plane he is to fly.

To provide such pilots to purchasers of Ford planes, we maintain a pilot's training school at the Ford Airport, at Dearborn. To be admitted to it

a prospective pilot must have had several hundred hours of flying, must pass physical examinations which parallel those of the United States air services, and must satisfy officials of the company that he is qualified, by his character and judgment, to be responsible for the lives of his passengers and for the good name of the Ford plane.

Purchasers of planes are welcome to send their own men to the school for this special training, if they meet the requirements. But we must ask them to consider our decision of their fitness final.

So important do we regard this provision, that we reserve the right to decline to deliver a Ford plane unless the pilot who will fly it meets with the approval of the officials of our training school.

We are determined that Ford planes shall be safe and that they shall be flown safely, insofar as it is within our power to control. The Stout Metal Airplane Company, Division of Ford Motor Company, Dearborn, Michigan.

Photo by R. Raymond Martin



Volume 14  
No. 2

# AERO DIGEST

FEBRUARY  
1929

THE MAGAZINE OF THE AIR

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Frank A. Tichenor, President.

A. Horsfall, Vice-President.

K. Healy, Secretary.

J. E. Horsfall, Editor.

George F. McLaughlin, Associate Editor.

William A. Rogers, Advertising Manager

Contributing Editors: Dr. Michael Watter, Cy Caldwell, Don Rose, Edgar H. Felix.

### BRANCH OFFICES:

BOSTON: 80 Boylston Street. Henry C. Pragoff, Representative. Phone: Hancock 8915 & 8936.

CHICAGO: 720 Cass Street. L. F. McClure, Representative. Phone: Superior 2802.

CLEVELAND: 915 Guarantee Bldg. Robert P. Smith, Representative.

KANSAS CITY: 307 Interstate Bldg. J. Hal Miller, Representative. Phone: Victor 1713.

LOS ANGELES: 1129 Mohawk Street. Frank Samuels, Representative. Phone: Dunkirk 6332.

PHILADELPHIA: 548 Drexel Bldg. Harry E. Hyde, Representative. Phone: Lombard 6671.

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Manhattan Island, New York City, photographed with a Fairchild aerial camera by R. A. Smith from an altitude of 16,500 feet

# AIR—HOT AND OTHERWISE

ON his way to Florida, Mr. Hoover said that Presidents of the United States would soon make their journeys by air. You are right Mr. President-elect, and with 100 per cent safety.

With every day aviation becomes safer. We do not find this out, however, from study of the flights made without accident, but from examination of the accidents. Less than a quarter (24.13 per cent), according to Department of Commerce figures, are due to weather and other conditions over which man has no control. Less than 7 per cent (6.78) are due to unknown causes. Into such accidents the personal equation of the flier does not directly enter.

It does enter into the remaining 46.74 per cent and rather startlingly. Of these very nearly half, or 22.95 per cent, are due to poor technique. Errors of judgment and carelessness, which are the very worst of poor technique, account, respectively, for 8.45 per cent and 6.32 per cent. Thus we have 8.54 plus 22.95 plus 6.32, or 53.26 per cent of all our airplane accidents, due to improperly selected, improperly trained or careless personnel.

To make it all a little easier to consider critically, let us say that half the accidents are due to man failure in the flying end, and a quarter to material failure, which is man-failure in the manufacturing end. That is three-quarters of all accidents, and only less than a quarter can be charged to weather and the like, with causes of 6.78 per cent unknown.

A competent and careful pilot and a well designed, well built, well inspected plane eliminate from flying three-quarters of the hazards, which is about what similar conditions eliminate from other means of conveyance—such as railroading and motoring.

Travel over established air routes in licensed and inspected aircraft is as safe as railway travel. It is certainly as safe as traveling by motorbus.

The Aeronautics Branch of the Department of Commerce is perfectly aware that, as soon as these things really are known, the public will demand air transport to an extent which at present to the average man would seem like a wild dream of the future. The Department, therefore, urges everyone who knows the facts to help spread them, and AERO DIGEST likewise prays.

Work, friends, to get publicity for air safety!

Air hazards will get publicity without any help from you, just as railway hazards once got all and more than they needed without assistance from Jay Gould and Jim Hill. The latter once stated that if a law were passed that every fatal accident from a runaway horse must be sensationalized in print and every railroad accident must be treated with the calm which would be justice, railroad stocks would boom and timid men and women would scream, horrified, at the mere sight of a horse.

That was a good deal more than twenty-five years after the invention of the steam locomotive. Whereas, according to the *New York Tribune's* "Twenty Years Ago" department, Patrick Y. Alexander, an Englishman, arrived in New York, December 29, 1908, and astonished a reporter by predicting that before the end of another year at least fifty practical flying machines, which could soar with stops not oftener than every thirty or forty miles,

*Safety, Yes—*

*Air Reorganizes Railroad*

*Back up Moffett!*

*Bingham Awakes N. A. A.*

*Luck to you, Bill!*

*Burnelli Comes Through*

By Frank A. Tichenor

would be in operation "over Europe."

If we predicted, now, that within another year as many as 100 machines a day would be turned out by the American factories, alone, in filling of legitimate orders, we should be well within the bounds of conservatism.

MENTIONING railways reminds me of a letter I have just received from that justly celebrated wizard of statistics, Roger W. Babson. He calls attention to the fact that the Minneapolis and St. Louis Railroad Company, a fine enterprise which has been having hard sledding, is likely to be reorganized and redeemed by turning to aviation for a solution of its problems. That is in line with what may be considered modern practice.

It seems that Mr. Bremner, an industrious and able receiver of the troubled property, had been unable to find any solution for the difficult problems of the company, including that of finding new money for rehabilitation. But as despair began to settle on the right of way and offices, certain New England bondholders, their intelligence worthy of the reputation of that section of the nation which produced Calvin Coolidge, made an interesting suggestion. It was to link Minneapolis and St. Louis with a new "airway-transport" line from Chicago to the Coast.

By means of planes the system can get independent entrance into Omaha, St. Louis, and Kansas City on a shorter and quicker time-table than any other road can offer.

So these bondholders now suggest the formation of the Northwestern Transport Company, which at once will take over some of the old securities of the road. Since aviation securities are in much demand, it is felt that this, so fully in line with the spirit of the times, will offer a practical way to make the ancient property once more a fully going and well paying concern.

According to the plan, this would be only one of the air-train services based on the foundation of the old railway which never paid a profit. Ready a little while ago to pass out of existence, it is ready now to come again into sturdy, even very active being by the aid of aeronautics. Lucky bondholders! Thus does the new science put life into old bones.

A COUPLE of months ago, we directed the attention of the airman and his wife and family to the absolute necessity of working toward the reappointment of Admiral Moffett as Chief of the Bureau of Aeronautics. As an alternative to this, we suggested to President-elect Hoover that he make the Admiral Secretary of the Navy. In this latter position, he would be a one hundred per cent improvement on the present incumbent. One hundred per cent and then a little more.

We knew when we suggested his reappointment to the Bureau of Aeronautics that a carefully worked out plan was beginning to function down in Washington with the railroading of the Admiral to West Coast obscurity as its ultimate desired result. To the Naval men of yesterday and day before, who form most of the elder brethren in the big building down in Washington, Moffett has been a pest because he knows that this is the Twentieth Century and that wars to come will be

(Continued on page 232)



# HISTORICAL DEVELOPMENT OF AIR-COOLED ENGINES

FLYING in its early stages was

considerably handicapped because lightweight power plants were not then available. For this reason practically all of the pioneers tried to develop air-cooled engines. They were unsuccessful in the main because of the lack of experience with air-cooling at that time. Nevertheless, the advantages of this method of engine cooling were so great, and the idea so basically sound that it has persisted until today it has practically taken the place of water-cooling.

One of the first spectacular flights in Europe was Blériot's, in 1909, across the channel. He used an Anzani three-cylinder 30 horsepower fan type air-cooled engine. It was virtually a large edition of a twin motorcycle engine with another cylinder added. Six-cylinder radials were next developed, and finally ten-cylinder engines as early as 1912. Cast iron was used for cylinders in all these early engines. In an effort to save weight, the sections were made much too thin for proper heat distribution, with the result that the power output was very low. Besides this, because the speed of the planes was extremely low (40 miles an hour being considered good), there was not sufficient air blast for good cooling.

To overcome this defect, rotary engines were developed. With this type the cylinders rotated about the crankshaft, which has held stationary. Their motion, usually 1200 to 1400 r.p.m., provided additional cooling, so that greater power outputs were available. The Gnome-Le Rhone and Clerget rotary engines, 80 to 110 h.p., reached a high stage of development in 1912. These engines weighed

By George J. Mead

Vice President of  
Pratt & Whitney Aircraft Co

Siemens-Halske, a bi-rotary engine with cylinders turning in one direction and crank in the other, was used by the Germans during the war. This engine developed 150 to 200 horsepower. Except for this engine, which weighed

two and a half to three pounds per horsepower.

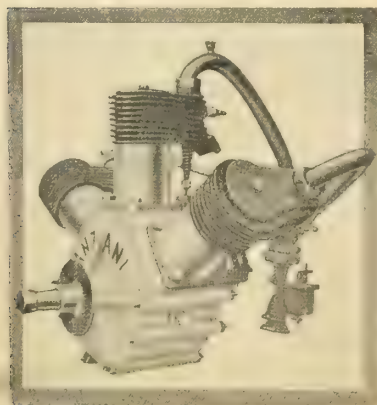
France entered the war in 1914 using these engines as standard equipment. The output of such engines was limited by centrifugal force, which made 1400 r.p.m. practically the limit. The bi-rotary engine with cylinders turning in one direction and crank in the other, was used by the Germans during the war. This engine developed 150 to 200 horsepower. Except for this engine, which weighed approximately three pounds per horsepower, the German engines were for the most part six-cylinder vertical water-cooled types, weighing from three to four and one-half pounds dry, without radiator. As more and more power was required to maintain

supremacy of the air, water-cooled engines became the dependence of the Allies. All this time, the speed of fighting planes was climbing, so that 120 to 130 miles per hour was obtained by 1918.

Yet weight reduction by air-cooling still held promise of the greatest improvement in plane performance. The British had carried on the development of the ABC fixed radials, 170 and 370 horsepower, to the point where, it was reported, they would be used as standard fighting equipment in 1919. As it was, the water-cooled type dominated the field at the close of the war and for several years thereafter. In-line and vee air-cooled engines were experimented with up to this time, the best known being the Renault Vee 8 in France, and the R.A.F. Vee 8 in England. The latter engine, developed by the Royal Aircraft Factory, was used in large quantities in British bombing planes.



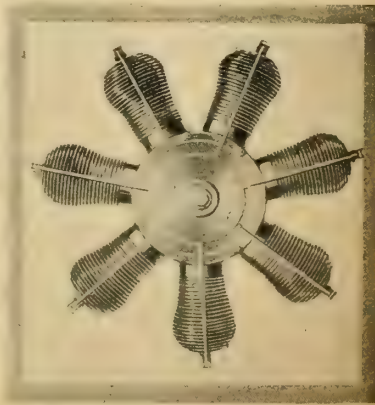
A Fokker F-10 with three Pratt and Whitney radial air-cooled engines



Anzani 3-cylinder fan type used by Blériot



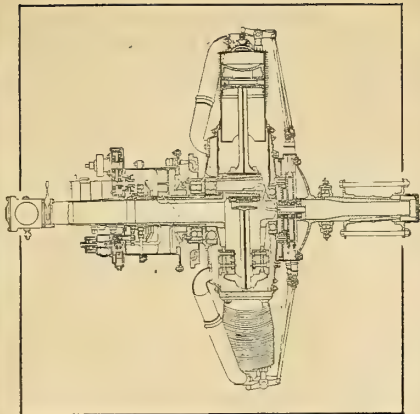
Adams-Farwell "double rotary"



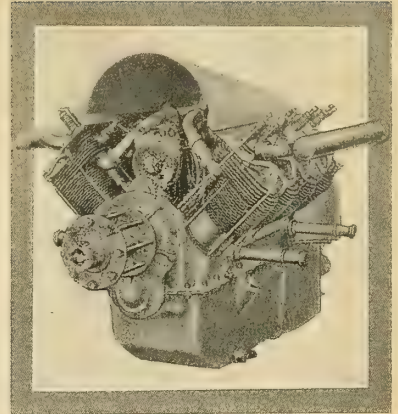
The French "Gnome" engine



A. B. C. "Dragonfly" engine



Siemens-Halske 11-cylinder rotary



Renault 80 horsepower engine

New development immediately following the war was stifled by the large supply of surplus war power plants. In England the Cosmos Company endeavored to develop the Cosmos 300-350 h.p. fixed radial engine, but failed financially. This firm was taken over by the Bristol Company, and the development of the now famous Jupiter engine was begun. The only other company abroad seriously developing new air-cooled types was another British firm, the Armstrong-Siddeley Company. Their Lynx 170 h.p. seven-cylinder, and the Jaguar 320 h.p. fourteen-cylinder radial engines were being developed during this period. The foresight of these two firms has well repaid them, for the products of both now have world-wide reputation.

In France the rotary slowly died out. The old Gnome and Le Rhone companies were finally united and a license obtained to build the British Jupiters, so that these old pioneer companies are still identified with air-cooled engines. Germany, due to the restrictions of the Armistice, apparently did not carry on any air-cooled development work, although Siemens-Halske continued to build the bi-rotary. Siemens took a Jupiter license, while B.M.W. turned to Pratt & Whitney for a license to build Wasp and Hornet engines as soon as these restrictions were lifted.

In the United States, up to the time of the war, only exhibition flights were made and some experimental work done, but there was little or no military or commercial flying. Among the air-cooled engines developed about 1913 was the American Gyro seven-cylinder 80 h.p. rotary, and numerous other purely experimental engines. During the war large numbers of Gnoms and Le Rhones were built here for the Allies. Very little strictly American air-cooled development went on during the war. In 1917 the Lawrance Company built some two-cylinder opposed and 60 h.p. three-cylinder radial engines for training

planes, and Mr. Kettering of the General Motors Company developed a small four-cylinder vee two-cycle air-cooled engine for an aerial torpedo.

In 1920 the Army Air Service initiated a design competition for a 350 h.p. radial. The competition was won by the Wright Aeronautical Corporation, which built what was known as the R-1. This engine had a solid master rod and divided shaft, and weighed 880 pounds. It was the first successful large radial engine built in this country.

The three-cylinder development of the Lawrance Company had given such good results that two nine-cylinder models were started, one of 175 h. p., for the Army, and another of 200 h. p., for the Navy. These two designs were ultimately combined in the J-1 which developed 200 h.p. at 1800 r.p.m. with a displacement of 786 cubic inches and a weight of 475 pounds. At this time, the Lawrance Company was absorbed by the Wright company, and a modified engine was produced called the J-3, or Whirlwind. The Navy was instrumental in encouraging this development, and placed production orders for both the J-1 and J-3. The J-3 performed so well that it entirely superseded the E-4 as the standard



Boeing Navy fighting plane with an air-cooled engine

Navy training engine. The E-4 was the American development of the French Hispano-Suiza, an eight-cylinder vee water-cooled engine developing 200 h.p. at 1800 r.p.m., with a displacement of 718 cubic inches and weight of 475 pounds. The success of the 200 h.p. radial caused the Navy to encourage the development of larger air-cooled engines. The Wright company built experimentally the P-1 and P-2, which were nine-cylinder engines of 1650 cubic inch displacement and of approximately 400 h.p.

In 1925 the Pratt & Whitney Aircraft Company designed the Wasp, a 1344 cubic inch engine of 410 h.p. at 1900 r.p.m., weighing 650 pounds. This soon displaced the then standard 450 h.p. water-cooled fighting engine for Naval service. This was the first 400 h.p. radial to go into pro-





The Cosmos Mercury engine

clone, another 525 h.p. engine. As a result of these developments, all new Naval airplanes are now equipped with air-cooled engines exclusively.

While these developments were in progress, the J-3 passed through two models, namely the J-4 and J-5. A re-designed engine, the J-6, was recently announced and is soon to be placed on the market. The Wasp passed from Model A to B, and finally C, which for military purposes is rated at 450 h.p. at 2100 r.p.m. Numerous small engines of less than 200 h.p. have come on the market during the last year. Various other types of engines have been built experimentally, such as the in-line, the vee, the double-row radial and the cam. The Army Air Corps has been especially interested in the vee type. The first of this type which the Army used was the air-cooled Liberty, and later some special engines were built on this principle. For larger powers, this type may be of interest, despite its weight and the cooling difficulties that it presents.

Aluminum for cylinder heads was not introduced until less than ten years ago. From that time the air-cooled advance has been rapid. Valve materials have also improved tremendously in the same period, as has our experience with materials for valve seats. The use of the radial type brought its own mechanical problems, principally those of valve operation, distribution and master connecting rod design. Since there was no precedent, each of these had to be solved by research and experiment. Those who follow will always owe the pioneers a great deal for such standardization as now exists in design. It will be found, as a result of this, that it is comparatively easy to design satisfactory engines of lower powers. The larger the power plant the greater the unknown field in which the engineer finds himself.

The single-row radial disposition of cylinders is more or less standard, primarily because of the maximum uni-

duction in this country. It was immediately followed by the Hornet, a 1690 cubic inch engine developing 525 h.p. at 1900 r.p.m., with a weight of 760 pounds. This engine is now being built in Germany by the B. M. W. Company. At practically the same time, the Wright company introduced the Cy-

form cylinder cooling thus obtained, but also because engines of this type give the lowest possible weight per horsepower. For maximum power with low fuel consumption, each and every cylinder must be cooled properly. With practically all other cylinder arrangements, air distribution for uniform cylinder

cooling is a difficult problem, and because this air must be turned through at least two right angles, the power plant drag is increased. It might also be noted that the cost of building and maintaining the radial type is lower than almost any other type. For these reasons, it is probable that the single row radial will remain supreme within its power limitations for some time.

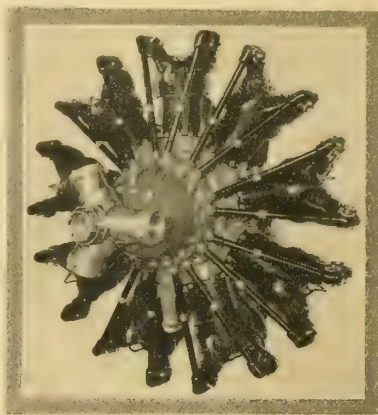
Air-cooling has been adopted just as fast as our technique and experience with it has permitted. For years a controversy went on between the air and water-cooled partisans. First we were told the air-cooled engine might be satisfactory in small powers as long as power plant weight, durability and fuel consumption were not important. The development and use of the 200 h.p. radial engine, however, proved that its weight was the same as the dry weight of its water-cooled contemporaries, so that there was a weight saving of 150 pounds in the power plant by the elimination of radiator and

and water. Its durability and fuel consumption were in general just as good as obtained with the water-cooled engine. At full throttle operation a slightly higher consumption was sometimes required with the older designs, but their cruising consumption—which is what really matters—was just as low as with the water-cooled engines. As a result of this service proof of air-cooling, the radial superseded the water-cooled vee in the 200 h.p. class.

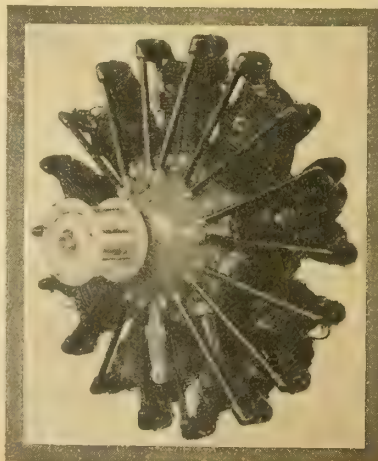
Having lost out in their contentions as to air-cooling for use in commercial and training planes, the exponents of the water-cooled engine next contended that the head resistance of a larger radial suitable for fighting planes was so great that speed would be seriously impaired. The fallacy of this argument was proved by taking the twelve-cylinder 450 h.p. water-cooled engines out of standard pursuit ships and replacing them with 400 h.p. radial engines. Even with the handicap of a ship not designed to take advantage of some 300 pounds (*Cont. on page 224*)



Armstrong-Siddeley Lynx



Pratt and Whitney Hornet



Pratt and Whitney Wasp



# KEEPING IT UP

By Don Rose

I'M all worn out. For nearly a week I've been helping with my prayers and air-minded optimism to keep the U. S. Army in the air out there in California. Hour after hour and day after day, not to mention the nights, I've stood behind and beneath that quintet of assorted officers and urged them to keep it up. My friends and neighbors one by one have weakened and quit, and have come around to tempt me to do the same. "Come on back to earth," they have urged, "and let the ship go down. You'll get a stiff neck and housemaid's knee if you, don't." But did I weaken? I did not! I kept right on giving my moral support and painful prayers to the Army, and the ship stayed up. If it wasn't for the fact that I simply had to take time out to get a haircut and shave, she might be up there yet.

You have to hand it to us. By us I mean the Army and the Weather Bureau and the gasoline reserves of the nation and all we air-minded people who haven't forgotten how to pray. We kept the ship from foundering on the fair but treacherous face of California, and we proved that an airplane can keep right on going until it stops. We proved once again the indomitable courage of the men of the Army, five of whom were able to stay away from home for practically a week without any casualties. We proved that an airplane chasing its tail around Los Angeles can command about 300 columnar miles of newspaper space, right in the middle of the open season for murder and sudden death. We proved also that records don't keep very well in the California climate, and that any standing record is a challenge and invitation to someone to knock it over.

There was another little thing we proved, and up to date no one has presumed to mention it above a whisper. We proved, it seems, that it takes an astonishing amount of foresight, faith and good fortune just to keep an airplane up, even if it isn't going anywhere. An airplane has this much in common with journalists like myself or even Cy Caldwell,—that its natural impulse is to sit down and rest. It has no inherent desire for the higher life. Left to itself it comes right home to mother earth, and there rests lazily on its tail.

The reason is that the airplane—again like Cy Caldwell and myself—is a law-abiding creature. It is aware that the ancestral wisdom of the universe has provided and appointed the law of gravity for the regulation of all human and interstellar traffic, and it tries to behave itself with due regard to the cosmic constitution and all its amendments. For which reason the plane as it sails the sky is always like a ship on a lee shore. A lee shore, for the information of landlubbers who may be listening in, is a shore too close to be comfortable and with a wind blowing consistently and persistently in that direction. Such a shore is not regarded with any real enthusiasm by sailormen.

I don't see that it does any harm to our favorite trade and profession to admit this. I don't think it need hurt anybody's feelings if we temper our enthusiasm for the latest thing in endurance flights by counting the costs of the experiment. We need to acknowledge the limitations of the plane as honestly as we insist on its possibilities, and among these limitations is the plain fact that every bird must come back at last to roost.

The moral—and you notice how earnestly and devotedly I hunt for a moral in everything and anything—is that air traffic needs a great deal more than air, just as sea traffic depends on ports and lighthouses and harbors. I'm quite aware, of course, that this endurance flight proved that a

well-behaved motor can work way beyond union hours without cracking, and that five full-sized men can live and move and

have their being in a cabin not much larger than a bathtub. I understand that it demonstrates also that a plane can take on supplies, such as gasoline, oil, chicken salad, baked beans, newspapers and clean collars from a sort of aerial corner store. I'll grant further than the Army is now one up on the Navy, and that it is up to the sailors to pull a fast one of their own, before the soldiers acquire squatters' rights on the mastery of the air. But when these matters are all conceded and entered in the log book of progress, it still remains a fact that the simple and sensible thing for an airplane to do is to come down occasionally, with the understanding that somebody will provide a place where it may do so without getting itself mixed with the scenery.

We can't let up on our ballyhoo for more and bigger and better roosting places just because it has been proved that a plane might fly across the continent and back again without needing one. There is, in fact, a bigger endurance test going on right now than any that has been tried or accomplished to date, here or anywhere. We have to keep going the airport program of these United States, far beyond the point where the bigger cities have their airports and a lot of little ones have back lots which go by the same name. We must work for a real air map of the nation, not spotted as if with measles but strung all over with airways in straight lines which are the shortest distance between two points. And we shall have to keep everlastingly on the heels of public opinion to prod it along to the point where it will get done.

Lately I have observed the aeronautical progress of a certain community which ought to know better. Half a dozen years ago it was already evident to the naked eye that this city would some day and soon need an airport. Nothing in particular was done about it, except that somebody made a survey and a report and a recommendation, all of which died immediately in their tracks. After a year or so, private persistence and enthusiasm persuaded a mayor that one way to get his name in the papers was to make talk concerning a municipal airport. Eventually the airport was designated, dedicated and delivered to the city, and located—as seems to be customary—exactly in the wrong place. There was another place which was logical, well located, and fit to use, but certain of the city fathers and their uncles and godfathers had a strangle hold on the real estate in that section, for which reason it never occurred to anyone to put an airport there. If it did occur to them, they said nothing about it, but pointed with pride to the municipal airport down in the back yard of the city where even the ducks have to wear overshoes.

And time went on and airplanes multiplied exceedingly, and some of them had to come to the aforesaid city whether they wanted to or not. And occasionally they upset on the municipal airport and sometimes they just got stuck in the mud there, and the air was blue for miles around with the profanity of pilots. So one thing led to another, and another mayor took counsel with the city fathers and their uncles and godfathers, and some more people got their pictures in the papers. And it was decided to build a bigger and better airport somewhere else, the first one having turned out like a lean horse with internal troubles, in that it could absorb any amount of financial nourishment without looking any better for it.

So there were more sur- (Continued on page 228)



# INTERIORS of CABIN AIRPLANES

**A**S air transportation grows in the United States, its facilities and accommodations continue to develop in proportion. Flying has become not only a swift means of travel, but a comfortable, clean and safe mode as well. That the railroad and automobile have contributed examples for the aircraft builder cannot be denied; yet the special characteristics which distinguish aerial from all other forms of transportation have been evolved by men engaged primarily in airplane design.

One of the greatest factors in commodious air travel as it obtains today is the cabin airplane. The natural outgrowth of its predecessors, the airplane cabin has made long cross-country flights practicable and desirable. It has made feasible the transportation of a relatively large number of passengers, and it has made it possible for both crew and passengers to fly without the discomfort of exposure to the weather. A comprehensive idea of all that the cabin airplane embodies, however, can best be derived from a review of some of the various types in production in the United States at this time.

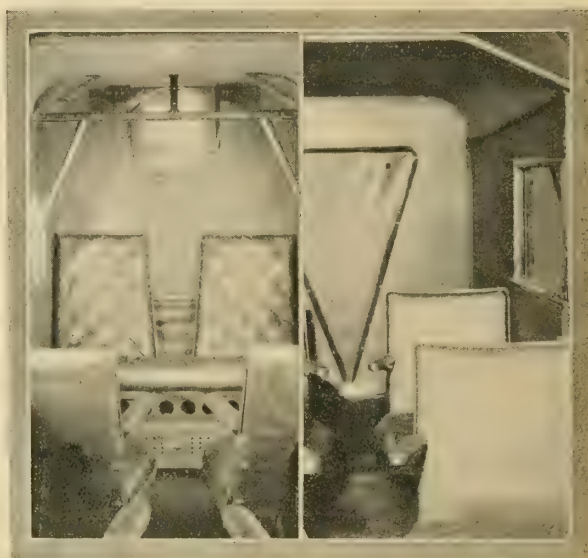
## Boeing Model 80

Boeing Model 80 is a trimotor cabin plane designed to accommodate 12 passengers. The interior woodwork is finished in walnut, and all exposed metal parts are finished in metallic bronze. A dark gray carpet covers the floor. The walls, from the base board to the window sills, are covered with brown leatheroid. From the window sills to the top of the windows, the walls are panelled with black walnut. Above the panelling, the walls and ceiling are covered with a dark brown, striped fabric. The base board, which is eight inches high, is finished in mahogany.

The seats, the frames of which are of dural tubing finished in bronze, are designed with high backs, adjustable to four positions, and are upholstered with dark brown leather. These seats are arranged in four rows of three seats each, with ample room between the rows. In each row, there are two seats together on the left of the aisle and a single seat on the right.

The windows are large and are unobstructed by structural members of the body. Non-shatterable glass is used in the windows, which may be partially or completely opened. A dome light provides illumination for the cabin at night. In addition, opposite each row of seats, there are shaded wall lamps which are provided with individual switches.

Mounted on a panel at the forward end of the cabin



The cabin of the Loening commercial amphibian

are an altimeter, an airspeed meter, a clock and a map or bulletin board.

In a compartment forward of the passengers' cabin is a small buffet from which light lunches can be served.

Aft of the main cabin is a large and well-appointed toilet room. Provision is made for running hot and cold water.

Forced ventilation and heating for the cabin are provided. This, combined with the fact that the entire cabin is insulated and sound-proofed, makes the cabin most comfortable at all times.

The baggage compartment is forward of the passengers' cabin. The door to it is on the left side of the fuselage. This compartment has a capacity of 72 cubic feet.

## Loening Amphibian

The Loening Cabin Amphibian is designed to accommodate six passengers, a pilot and a mechanic. The body is of composite construction, wood structure, dural covered. An exhaust heater is provided for winter flying. The interior of the cabin is fully upholstered with tan headlining and brown leatherette. The seats, four of which are swivel armchairs, are arranged in three rows, with the first row built in facing the other two.



Interior of the Boeing Model 80, accommodating twelve passengers



Special and standard Sikorsky interiors

Magazine racks and an automatic cigar lighter are also provided. A collapsible table may be mounted in the center of the cabin. A folding desk of walnut at the front is so placed that it may be used by persons in the two forward seats. A large dome light, together with two small lights on the rear wall, is provided for the illumination of the cabin at night. Triplex windows extend the length of the cabin. These windows may be raised and lowered by means of a mechanism similar to that used in enclosed motor cars.

The cabin is over six feet long and four feet wide, and has a sixty-inch head room, thus affording ample space in which to walk about. Doors are provided on each side of the cabin, with corrugated steps on the hull and handles on the side to facilitate entrance. These doors are of heavy construction. Just back of the pilot's seat is a win-

dow which may be opened to permit direct communication with the cabin. The baggage compartment is forward, and a small lavatory is located in a compartment to the rear.

#### Curtiss-Robin

The Curtiss-Robin is a three-passenger cabin monoplane. Door handles, window lifts and control sticks are fully nickeled. Every precaution has been taken to make the cabin wind and weather tight and as nearly sound-proof as possible. Good vision is assured by the fact that the doors and windows have narrow pillars.

The two passengers' seats, which are in the rear of the cabin, are slightly staggered to provide ample shoulder room. They may, however, be adjusted to form one continuous wide seat. The seats are provided with deep soft cushions.

Just aft of the passenger seats is the baggage compartment, which has room for three suitcases and several parcels.

#### The Sikorsky S-38 Amphibion

Several improvements have recently been made on the cabin of the Sikorsky Amphibion. The cabin is slightly higher in the rear. Rear cabin lights are integral with the ventilators. The redesigned ladder, leading to the top entrance, has only three steps. Back of the stairway, entrance to the toilet room is provided. The side walls are Micarta panels of water-proof mahogany finish. The eight seats are of wicker and are arranged in four rows. Windows are of non-shatterable glass. A thick rug covers the floor. Luggage space is provided forward of the pilot's compartment.

The appointments of the special job which is pictured are comparable to those of the finest private yachts. Besides four handsome wicker chairs, there is in this special cabin a long spring couch with soft leather cushions. A highly polished cabinet with a drawer and folding top is placed opposite the couch. Other fittings include ash receivers, carafe, vanity case, and instruments for the convenience of passengers. A toilet room is provided at the stern, with a door leading into the main cabin.

#### Ryan Brougham

The interior of the Ryan Brougham is completely upholstered in mohair. The seats are spring cushioned, upholstered in striped mohair. Appointments include ash trays, curtains and dome lights. Automobile locks are used on the doors and a snap lock door affords access to the baggage compartment at the rear of the fuselage.



Fore and aft views of the three-passenger Curtiss-Robin monoplane



The instrument board of the standard Brougham includes: tachometer, turn and bank indicator and air speed meter (all located directly ahead of the pilot), altimeter (to the right), motor temperature and oil pressure gauges (to the left). Gas line shut-offs and carburetor choke are beneath the instrument board. Stabilizer lever and throttle assembly are to the pilot's left. Wheel brake pedals are a part of the rudder pedals. The windows on each side of the pilot are adjustable up and down.

#### Bellanca CH

The Bellanca CH is a six-passenger cabin monoplane. The passenger cabin is seven and one-half feet long. The cabin may easily be reached by the relief pilot if passage to the rear is desired. Large windows assure excellent visibility either from the control cockpit or the cabin. It is heated to provide comfort in winter flying. The cabin is well appointed throughout. The interior is finished either in broadcloth or fabrikoid. The chairs are wicker, and are securely fastened to the fuselage. Each chair is provided with a handsome safety belt with plated buckles, the belt itself being fastened to the main longerons and cross members and in no way connected with the chairs.

#### Fokker F-10

The cabin of the standard Fokker F-10 is designed to accommodate twelve passengers. It is 16 feet in length, 5 feet in width and 5 feet 9 inches in height. The finish in the cabin is mahogany and gray light pile fabric. The twelve armchairs are equipped with deep cushions and head rests. Daylight is admitted through large sliding windows of non-shatterable glass. For night flying, dome lights furnish illumination. Regular equipment includes a good-sized lavatory, supplied with running water and fitted with a toilet, wash basin and mirror. Two additional compartments, with a total space of 105 cubic feet, are provided for mail and baggage.

For special jobs a kitchenette can be installed. This kitchenette is equipped with a small refrigerator, sink, drain board, water supply, rack for dishes and cooking utensils.

Special cabin furnishings also may be installed in the F-10.

#### Stinson-Detroit

The interior of the Stinson-Detroit, a six-place cabin monoplane, is finished in royal blue mohair, a blue color scheme being carried out in the whole cabin. Balsam Wool insulates the cabin against sound and variations in



The cabin interior of the Bellanca CH

temperature. The cabin is equipped with two exhaust heaters. The seats are so arranged that the passengers sit opposite one another. The frames of the chairs are of seamless steel tubing, reinforced with cane webbing. Large non-shatterable glass windows afford excellent visibility. At the rear of the cabin, there is a baggage compartment, which, if the owner desires, may be enlarged and converted into a lavatory.

The Stinson Junior, a 4-place type, embodies most of the same features as the Detroit. The cabin of the Junior measures 84 inches in length, 47 inches in height and 38 inches in width. It has a pay load capacity of 42 cubic feet.

(This article is to be continued in the March issue of AERO DIGEST at which time other cabin interiors will be described.)



Appointments of a special interior arrangement in the tri-motored Fokker F-10



# METEOROLOGY

**M**ETEOROLOGY, as usually defined, is the science of the earth's atmosphere. It embraces, therefore, both climate and weather. Climate is concerned with statistics and deals with the normal or average state of such elements as pressure, temperature, humidity, cloudiness, precipitation, sunshine, fog, storminess, visibility and wind. A proper appraisal of the climate of a place or region must be based upon data covering a period of many years. The greater the length of this period, the more accurate will be the appraisal.

The state of these same elements at a given time and place, or during a particular period and in a specified region, is what constitutes weather. It can and does vary from a state of calm serenity to one of utmost peril to life and property.

Meteorology may also be considered from the viewpoint of theory and practice. In the former the various phenomena of the atmosphere that are our daily companions are studied in an effort to get at the underlying laws governing our weather and its changes. Although the interest here results in part from a desire to increase the sum of human knowledge, the chief purpose is to make more effective its practical application. To-day applied meteorology is definitely and actively associated with all lines of industrial and commercial activity, and thus we have such subdivisions as agricultural, horticultural, insurance, marine and aeronautical meteorology. All of these are comparatively new, but perhaps the most recent is that branch which serves aeronautics. Certainly its development, in the past two years at least, has been more spectacular and on a much larger scale than has that of any of the others.

Aeronautical meteorology, like the more general subject meteorology itself, deals with statistics, or climate, and with current service, or weather. Aeronautics has very definite relationships with both. Let us see what some of them are.

Statistical information may for our present purpose be divided into two classes: (A) that needed in developing the ground organization; and (B) that useful in determining regular flight schedules.

A. Ground organization. For the ground organization there should be included such climatological factors as frequency of different wind directions at the surface; average velocity of surface winds, classified by direction; frequency of strong surface winds, also classified by direction; and frequency of gusty winds, poor visibility, fog, haze, smoke, heavy precipitation, etc.

As a rule there can be no great latitude in the location of airports, since these will necessarily be near the larger centers of population, and must be within reasonably easy reach of them. Little, if any, use can therefore be made of information concerning certain other climatological factors such as the frequency and intensity of thunderstorms, violent storms and temperature extremes, since in a small area their variation would be unimportant.

On the other hand there is in many cases, within comparatively small areas, considerable variation in wind con-

By Willis Ray Gregg

*Senior Meteorologist in Charge,  
United States Weather Bureau*



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ditions and especially in visibility. Gustiness is greatly increased by topographic irregularities, buildings and trees. A site as nearly free from these as possible should be selected. Information as to frequency of different directions and velocities of surface winds is important in connection with the orientation of hangars and the layout of runways.

But by far the most important factor to be considered in selecting an airport site is visibility. The relative prevalence of haze and smoke, particularly the latter, is a function of the prevailing wind. In general the selection of a site on the leeward side of a city should be avoided, other things being equal. However, primary consideration should be given to the occurrence of fog,—the one condition that reduces the visibility to zero. C. G. Andrus has the following to say on this subject, based upon experience

as meteorologist at Hadley Airport since shortly after the passage of the Air Commerce Act of 1926:

"Fog frequency may be the deciding factor between airport locations otherwise equal. There is every reason to expect that the hazard attendant upon endeavors to enter an airport enveloped in fog will be only slightly minimized in the next few years. Only in necessity will it be done, and with passenger cargoes will be almost a prohibited maneuver. A dense fog 200 feet deep completely nullifies the utility of an airport as a terminal of entrance. Departure may be taken under such conditions if the airway to be travelled is clear of fog and the airport properly equipped, but even this is attended with considerable danger."

Fog frequency varies decidedly, in many cases within small areas. Particularly is this true along the coasts of the Great Lakes and the oceans and in the neighborhood of rivers and small lakes. In general, all low-lying areas should be avoided, so far as possible.

In addition to wind and visibility, some attention should be given to the precipitation characteristics of a place. If heavy rains are frequent, the airport must be properly graded and drained. And if heavy snowfalls are to be expected, provision must be made for quickly clearing the runways. It is true that rain and snow do not vary much in amount within a small area, but some parts of such an area would in many cases be better than others for resisting the erosive or softening effects of excessive rainfall and for quick clearing of heavy snow.

In the case of airports for the larger cities, sufficient data are already available, as a rule, in the records that have been compiled at the local Weather Bureau offices. In some instances, however, it has been advisable to make what may be called a local meteorological survey. Several of these have been made and others are now being carried on. Perhaps the most complete is the one for San Francisco which covered one year and was conducted by that city in coöperation with the Federal Weather Bureau. Elaborate equipment was installed at several proposed sites, and observations were made in (Continued on next page)



great detail, of fog frequency, ceiling, visibility, gustiness and other meteorological elements. It is significant that the final selection of the San Francisco Municipal Airport was based solely upon the findings of this survey.

For the smaller cities and towns the problem is less difficult as a rule, the chief purpose, in many instances at least, being to provide intermediate landing fields on the major airways that will be available for emergency use. However, information concerning the average conditions at these smaller airports is needed and has been supplied and compiled by the Weather Bureau as part of a series of individual airway bulletins, published by the Department of Commerce. The meteorological data include a wind rose and a brief summary concerning strong winds, fog and heavy precipitation.

There has also been published a series of 48 bulletins, giving in more general terms the climatic characteristics of the several States. These contain sections on cloudiness, fogs, visibility, heavy rain and snow, ice in lakes and rivers, thunderstorms, surface winds, including frequency of strong winds, and upper air winds.

B. Schedule maintenance. Climatological factors useful in determining the most efficient flight schedules include resultant winds at flying levels; frequency of different wind velocities at flying levels, classified by direction; frequency of widespread storms; frequency and intensity of thunderstorms; frequency of low clouds and fog; visibility; and general character of precipitation.

In determining flight schedules for any proposed airway the most important datum is, of course, the cruising speed of the aircraft employed. To this must be added, or from it deducted, the resultant wind at different points along the route. This corrected value forms the proper starting point or basic datum for determining schedules. The operator of any service must decide what percentage of arrivals on time he will undertake to guarantee. It is then a comparatively easy matter to compute the schedules that, on the average, can meet this guarantee. The principal determining factor is the frequency of head and cross winds of various velocities, resolved into components parallel and perpendicular to the course. In general a considerably faster schedule can be adopted in this country for eastward than for westward flights, since, as is well known, the upper winds are prevailing from the west. Moreover, the upper winds in general increase in velocity with altitude; therefore eastward flights should be at a higher level than westward flights.

Allowance should be made for a certain percentage of canceled flights. This percentage will vary in different parts of the country and will also have a marked seasonal variation. It can be determined quite closely by an analysis of such climatological data as the frequency of widespread storms, low clouds, fog, poor visibility and heavy precipitation, especially snow. These conditions not only cause delays but occasionally prevent flights altogether.

Sufficient data are now available for studies of the sort above referred to. These data include upper air conditions, a branch of the subject that may very properly be called "aeronautical climatology." Already, practicable schedules for various cruising speeds have been determined for two of the airways, based upon a guarantee of 90 per cent arrivals on time. Similar analyses are being made for others of the major airways.

Statistical information has its place in aeronautics, and a very important one, as has already been seen. Yet, in a very real sense, it may be said to be only preliminary to the chief service that meteorology can render; namely, furnishing up-to-the-minute weather reports and forecasts for each and every flight. Nothing short of this will do. The

experience of the past two years is conclusive.

In order to gain public confidence and support and to demonstrate its right to a prominent place in the industrial and commercial life of the world, flying must be both safe and efficient. Many factors enter in, including design and construction of aircraft, facilities at airports, marking and lighting of airways, instruction of pilots, licensing of aircraft, and adequate weather service. Some of these are chiefly concerned with safety, others with efficiency.

A. Safety. Until comparatively recently, weather was generally thought to be responsible for quite a large percentage of aircraft accidents. This is no longer true. Weather service has already been developed to the point where accidents from weather rarely occur, if the warnings are heeded. It is significant that, in Report No. 308, "Aircraft Accidents" issued by the National Advisory Committee for Aeronautics, weather as a cause of accidents occupies an inconspicuous place in the "miscellaneous" section. It is of interest also to note that in an analysis of accidents published in the 1928 Aircraft Year Book by the Aeronautic Chamber of Commerce of America, Inc., only 12 out of 200 accidents and only 9 out of 164 fatalities were caused by weather. Of course even this number is too high and must be reduced, but the fact remains that weather is now one of the minor causes of accidents.

B. Efficiency. The case is entirely different when we come to efficiency. Here the weather service is the controlling factor. It determines whether the flying along an airway will be of the haphazard, hit-or-miss variety or of the type that takes advantage, in unfavorable weather, of every brief break or opening that would enable a pilot to get through. Accuracy and promptness are the main essentials of such a service. Let us see what kind of an organization can best provide them.

1. Accuracy.—In the first place there must, of course, be a system of regular weather reports at least twice, preferably four times, a day from a large area. This system of reports is fundamental, and all civilized countries have it for their own areas and usually for portions of adjoining countries and oceans. The reports are based upon observations made by trained personnel with standard instrumental equipment, and include upper air as well as surface conditions. They are collected at certain central points, and weather maps, bulletins and forecasts are issued.

The next requirement is a system of supplementary reports for comparatively small areas, each area covering a section of an airway. As yet it is difficult to say how frequent these reports should be, but it is significant that those who have had most experience in this work strongly advocate at least two-hourly and preferably hourly reports. If at two or three-hour intervals, they should include not only places on the airway itself but also a few selected points at some distance from and on both sides of it. These enable the meteorologist to watch the development and movement of adverse conditions approaching the airway from either side. If the reports are made once each hour, they may be limited to points on the airway itself, except that every second or third one should include also those at some distance from it.

These intermediate reports are based upon observations made by properly instructed, though not technically trained, personnel and with a set of instruments for indicating only the more important elements. The reports are accurate, but not of the high precision required in the general system for the whole country, and they include only information that is really needed, such as the state of the weather, ceiling, visibility, wind direction and velocity, temperature,

(Continued on page 240)

# AVIATION CLUBS IN SECONDARY SCHOOLS

By Herbert J. Stack

*Fellow in Safety Education, Columbia University*

**P**ARALLELING the remarkable growth in aviation in recent years has come an interesting development in the aviation clubs of junior and senior high schools in the United States. This development is especially significant because of its unusual educational value as an extra-curricular activity in high schools. Moreover, it is making important contributions to a more widespread air-mindedness.

It is estimated that more than 200,000 boys, as members of high school organizations, have built and flown models. To state that there are probably over 500,000 young men and women in secondary schools who are interesting themselves in the construction and operation of model airplanes is not, I believe, to exaggerate the situation. Indeed, nearly fifty per cent of our organized junior high schools already have their aviation or model building clubs.

Aviation has become a watchword for the American youth. Such words as fuselage, camber, ailerons, angle of attack, etc., hitherto confined to the technical vocabulary of aviation experts, are becoming part of the vernacular of our school boys. This is highly significant for aviation; for when any enterprise, activity, or institution becomes a part of our great public school program, its success has been justified and its worth attested.

As a supervisor of high schools, I have been fortunate enough to have had a part in the organization of several of these clubs together with one club of older men for the study of aviation. My experience has repeatedly shown that it is highly important that the very best advice be available for these young enthusiasts in their study of aviation. The junior high school, with its fine shops and mechanical drawing equipment, is perhaps the place where the best work can be done.

Probably the older eighth and ninth grade pupils of the junior high school, particularly those who are studying or have studied science, are the most useful members of the club. A single meeting a week hardly suffices for carrying on the club work, for in order to get some things accomplished two meetings are desirable. Experience has taught that not too much time in the club period should be used in model building. The club period ought preferably to show the way, indicate best techniques, provide for an interchange of parts or opinions and serve as a clearing house for designing and getting boys started on their model building at home.

For purposes of directing the work of the club the fol-

lowing method has worked most satisfactorily. The officers should consist of a squadron commander who takes

charge of meetings and acts as president, an adjutant who takes care of duties normally executed by a secretary and treasurer, a chief engineer officer who has charge of programs dealing with types of motors, a chief designer who has charge of aircraft model design programs, an instrument officer who has charge of any programs dealing with instruments or accessories, and a flight commander who arranges contests and competitions, and assists club members in model building.

The work of the seventh and eighth years should be confined mainly to model building on the small scale, preferably designing models and propellers in the first year and following this up with actual model building in the second year. The most important feature in the club, however, should be the actual building and flying of the model.

The manufacture of inexpensive models by industry has made available at department stores, a great many fairly reliable models. Models from Japan, Germany, England and other foreign countries are competing against our American built models. There is, however, little significant educational value in merely buying a plane at a store and flying it. The real value comes in drawing plans, buying the rough stock, cutting, bending, wiring, doping and the other manipulations that come with model building. The real thrill comes with flying a model plane which one has actually built himself.

After it has specialized in model building, what important projects can the school club carry on as further activity? Four years of experience with aviation clubs have led me to believe that such projects as the following are valuable:

*First*—The building of a model aviation flying field or an air mail landing field. Such a field should be built to scale so that it may be placed upon the stage of the school auditorium and should include hangars, beacon lights, floodlights, etc. An exhibition of models and the operation of the landing field at a special assembly of the school would be of unusual interest. At such an assembly, worked out by club members at Cochran Junior High School, the landing of a night mail plane was featured.

*Second*—Safety in aviation may be made a very interesting project and ought to be included as an important part in the program of every well (Continued on page 218)



Lee Krupnick

Thousands of high school boys are building and flying model airplanes



# AIR NAVIGATION MAPS

WITH the decision of Congress in 1926 to place the Department of Commerce in a position aggressively to encourage the development of commercial aviation came authority and money to publish air navigation maps covering the lighted airways and other routes most often used by civilian aviators.

Previous to this time the Army Air Corps had laid out a program for the publication of 52 aviation maps covering the routes most often used by its own fliers. The Hydrographic Office of the Navy Department had also begun the preparation of a series of aviation charts for the use of its seaplane fliers. Both these departments were primarily concerned with meeting the military and naval needs of their own personnel, and the use of the maps and charts by civilian aviators was incidental.

Aviation authorities, however, convinced Congress that commercial aviation could best be advanced if a program of publication of air maps was planned with the needs of the civilian flier foremost.

As the Army Air Corps had many of its series well on the road to completion, and as they were all urgently needed for military purposes, it was decided to complete this program. This has been accomplished, and additional maps will be issued by the Air Corps only as military needs require maps which are not on the program of the Department of Commerce to be published for civilians.

For the use of seaplanes, the vast majority of which are owned by the Navy, the Hydrographic Office publishes charts of the coast. This division of the work left to the Department of Commerce the responsibility for publishing air maps of the interior covering the lighted airways and other routes. The work was assigned to the Coast and Geodetic Survey which has charted for water navigation practically all the coastal regions of the United States.

Using the experience of the Army Air Corps as a basis, the Bureau set to work to publish a series of standard aviation maps. The work, particularly in portions of the west, has been most difficult, because in many sections topographical maps showing altitude, roads, rivers, lakes and other features are not available. In fact only 40 per cent of the United States has been covered by government maps of this character.

The publication of these aviation maps is an excellent

*Methods used by the Department of Commerce, Army and Navy to compile and keep Air Navigation Maps up-to-date*

By Douglas W. Clephane

example of the manner in which the various government departments can co-operate in an important project. Although the maps are prepared under the supervision of the De-

partment of Commerce, there is scarcely a single other department that does not contribute data for compiling them.

Every possible source of information that will add to the accuracy of the maps has been and is being used. The usual sources include Geological Survey index and base maps, Federal Aid Highway System maps, Forest Service maps, Agriculture Department Soil Survey maps, Post Route maps, railroad altitude maps, state and private road maps, airway beacon maps, Coast and Geodetic Survey Coastal Charts, and maps of equal magnetic declination and of annual change in the United States. These are the usual basic sources, but when all the features which the various maps contribute have been checked and placed on the preliminary work sheet, many of the best landmarks for aviators are not shown. The exact location of transmission lines, oil tanks, dams, race tracks, emergency landing fields, permanent airports, electric lines, and other features must be obtained from other sources.

The companies which own these properties give the closest cooperation to the Bureau in locating features which are not shown on the usual maps. Whenever there is a conflict in the location of some feature between two or more of the maps used, a most careful check is made by the best

authority in that section. Sometimes there is a government engineer or survey party in the vicinity from whom the correct data can be obtained, but more often the check is made by local authorities or private engineers.

In the sections where there are no government base maps, the most accurate information available is obtained from county surveys, railroad companies, up-to-date road maps, the engineering branches of public utility corporations, and other sources. Each feature is placed on the map only after accurate information has been received from at least one and in many cases three or four sources.

It is most important that such features as mountains, airports, transmission lines and compass courses can be seen at a glance at the map. The aviator flying 100 or more miles an hour has little chance to make a detailed study of the map in the air. For this reason the Commerce maps are printed in



Official photo, U. S. Army Air Corps.

How the Army Air Corps makes aerial photographs for maps.

nine or ten colors, seven of which are used to denote varying elevations. Many more tints are used by the Army Air Corps. The first Commerce map issued showed towns and cities in red, the same color used for the compass course, transmission lines and other features. This was following the style of the Air Corps maps. After suggestions from a number of aviators this was changed to yellow, and the map was reprinted in the new color. The Air Corps maps still use red to designate the towns and cities, but it is expected the new color will be used if additional maps are published by the Army.

It has been found impossible to locate accurately all the landmarks which are of value to fliers without a careful flight check. The first copies of a new map are given to an official of the Bureau who flies the course and makes such corrections or additions as are necessary. After a flight check changes in the locations of towers, electric lines, roads and other features are usually necessary, as well as the addition of useful landmarks.

The maps when first issued are as accurate as it is possible for the best engineers in the country to make them, but the responsibility of the



Department of Commerce program of air navigation maps. Ten of the forty-two maps planned are now ready for distribution.



Army Air Corps program. All these fifty-two maps have been completed.

Coast and Geodetic Survey does not end with their issuance. The use of the maps by experienced fliers usually brings to light certain features which have been omitted that are of great value to the aviator in strange territory. Close contact is kept with public utility companies using power lines, water companies, state highway commissions, railroads, and oil companies, as well as the Aeronautics Branch of the De-

partment of Commerce, so that changes such as new power, railroad and electric lines, tracks torn up, new and abandoned airports, new dams, oil tanks, race tracks, and emergency landing fields may be noted as they take place.

Only a small supply of each map is printed originally, and as the supply runs out, additions and changes are made to the plate so that each map as it reaches the purchaser shows practically all the latest data received. Reprints of Commerce maps with plate changes are made three or four times a year, while Air Corps maps are brought up-to-date once a year. Navy aviation charts are kept up-to-date by regular notices to aviators of changes. Corrections are also made to all charts in stock as the notices are issued.

Use of the seven maps already published by the Coast and Geodetic Survey has fairly well established the data which are

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**Navy aviation chart program.** Air charts of the Atlantic coast have been completed and the first of the West coast charts will be ready early in February.



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## RATING FOR AIR SCHOOLS

IT is Senator Bingham's Bill which provides that air schools wherever located in the United States should have official rating. The Senator sees the eagerness of young America to acquire wings, but realizes that before they can be given safely and wisely Young America must have been taught how to use them.

Only thus can he be rendered potentially valuable to the aerial defense force of the country. Yet there is no official standard for air schools, and students have no means but chance of finding which are good and which are bad. There is no standardization, no stabilization, no rating, the Senator declares, surprising though the fact may be.

His plan is that the Department of Commerce shall set up machinery to correct this evil situation and that schools foresighted and public spirited enough to realize its importance will be certain to ask for the inspection so that they may get the rating.

We agree with Senator Bingham. At present nothing mandatory should be included in the legislation, but the rating should be available to schools wise enough to ask for it. The public will then decide whether or not it cares to spend its money upon schools which have not seen fit to strive to get this official hallmark of their excellence and good intent from the Department of Commerce.

## BROADCASTING PEP

SOME broadcasters convey only words, facts, stories, music (from jazz to Beethoven) to their audiences, but aviation now has one who can send pep through the microphone. That's something worth while. This is Carl Reimers of the successful advertising firm, Reimers & Osborne, and during the last few months we have discovered that not only aviation specialists but the whole public is fascinated by the subject—intensely, practically interested in it. Sponsored by such concerns as Vacuum Oil, the Wright Aeronautical Corporation and others of importance in the industry, the Reimers half hours help Mr. and Mrs. United States to get air facts easily and impressively. This ex-service man is anxious that his fellow citizens should know the lessons of his instructive experience, and it is our definite suggestion that all interested in aircraft should cooperate in his valuable work.

## THE QUESTION MARK

THE epochal flight of the Army monoplane *Question Mark* has written an exclamation point into aviation history. The marvelous achievement of the Army plane was a triumph, not of any service, but of American ingenuity, which, being American, must permeate all services.

If the Army, working alone, did that, the separate control advocates urge, the Navy, in rivalry, will be led to do something better. That argument is un-American.

Any student of civilization of the United States will find it teaching one great lesson—that of the advisability of team work.

When experts work apart they duplicate expenditure and effort. They miss tricks that coöperation would have made easy.

Unify all air forces and keep the fingers of the non-expert out of this highly specialized and scientific technical branch of our national defense and we shall be intelligently preparing for that day when the safety of the nation will depend principally on aviation, and with the Army and the Navy working as subordinates thereto. It is inevitable, why not acknowledge it? There is a very pertinent question mark.

## ANOTHER BLOW AT THE ARMY AIR CORPS

SEVEN million dollars is a lot of money. The War Department appropriation bill, as passed, cuts virtually that sum from the amount to be made available for carrying out the Army Air Corps' five-year expansion program.

Of course, no such murder will be permitted of that branch of our national defense which will be its mainstay if a war comes, in spite of all their cruiser bills, gilt epaulettes, appropriations and great funds for the prevention of babe barnacles upon midshipmen's eyebrows. The Senate seems to be alive to this sad piece of House unwisdom and may be expected to do something.

Of the 110 planes required for the program not one was provided for; hangars and shops for their maintenance naturally, therefore, were ignored; members of the House took the ground that Reserve Flying officers, in order to keep in perfect training, need but one hour of flying time per month—thus giving them full credit for superhuman cleverness.

The five-year program has been authorized by Congress. Annual appropriations to make its realization possible, therefore, are perfectly in order. That negative procedure should mar the record of the House for patriotism and common sense is a matter which must be brought to very general attention among the nation's voters.

## HERBERT HOOVER, JR. IN AVIATION

HERBERT HOOVER, JR., son of the President-elect and a youngster as ambitious as his distinguished dad once was, is also a wise youth, for he is hooking up with aviation, having joined Western Air Express, Inc., of Los Angeles, becoming technical assistant to Harris Hanshue, president.

Having specialized in wireless, he will begin his work as the director of the growing air-travel system's development of radio communications. His first real job seems to have been negotiation with the Federal Radio Commission, at Washington, with regard to the pending application of his company for the right to establish wireless communication contacts in the West. The Western Air Express recently was granted four short wave spectrum channels for radio telephone communications.

It is all very significant and satisfactory to members of the Air Klan, and the youngster long has been a cause for general rejoicing among radio fans. The President-elect has said that it was "Junior's" interest in radio which aroused his own. Perhaps "Junior" also stirred his interest in aviation. Herbert Hoover, Jr., is a married man and leaves an instructorship in Harvard to take up his new work in aviation and radio.

## CY-ZING UP THE GNUS

HE thought he knew the gnu, but he never knew that gnu. It was, in fact, another gnu—a new gnu in the zoo, new arrived from Timbuctoo. For the gnu that once he knew had passed away with flu. So that gnu he thought he knew was another brand new gnu—and not the gnu he thought he knew at all.

Try that over on your tonsils, and if you can't say it without getting as mixed up as the Versailles Treaty, write to your Congressman and complain about it. Or sue me for damages: It's a little test I've devised for the use of Department of Commerce inspectors to enable them to determine whether or not an applicant for a pilot's license has had a drink today. If he says it perfectly, then he hasn't had a drink, but needs one. Which is the cue for the inspector to say, "Let's go back to the hotel—it's no day for flying, anyhow." When this test really gets working the aviation business will be brighter and better.

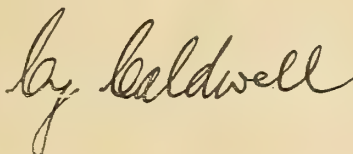
**SPEAKING** at a municipal election meeting in England, Admiral C. J. Eyres, Royal Navy, said: "My colleagues on the Council are the most charming and amiable set of men in private life, but if I had to judge them in the public Council Chamber, I would say that they were the most irritable, thin-skinned, ill-tempered set of men in the three kingdoms."

To find an Admiral, a man trained in a lifetime of quiet and silent obedience to his superiors, to tradition, and to almost everything else, coming out and saying what he thinks is most refreshing. To find him thinking at all is surprising; for Naval training does not encourage thought. Let me quote my good friend the Hon. Curtis Wilbur himself, on the subject of Naval training. Rear Admiral William S. Sims, one of the few clear-thinking men who have risen to high position in the U. S. Navy, and Dr. Angell, President of Yale, voiced their criticism of the sacred Naval Academy at Annapolis, upon which good old Curtis, with a loud, pained cry rose up and said: "In the olden days they used to take boys as young as 10 and 11 years, and now to take older men would militate against the fundamental requirement of Naval life, discipline and the habit of obedience."

There we have it: the most essential part is to establish the habit of obedience; that is the "fundamental requirement." To educate him, to teach him to think for himself, to teach him to ponder upon old weapons and reach forward eagerly for the newer and more efficient—that is a minor consideration, and not a fundamental requirement. Is it any wonder that stereotyped Naval officers think, if at all, only with the greatest difficulty? We cannot blame them; they are not trained for it. Hence is it surprising that after a lifetime of discipline and obedience, when they have grown old and hide-bound, that they should be unable to think clearly about any new form of defense such as aviation and gas? It doesn't surprise me; I'm amazed that they do as well even as they do, poor fellows. They learn the habit of obedience, the fundamental requirement, the routine procedure of their profession, and how to drink tea at tea-fights without making a swishing sound.

**HEADLINE:** "AIRPLANE HONEYMOON ENDS IN CRASH." So do thousands of others that never even started in an airplane.

By



A SURPRISING bit of gnus from

Norfolk informs me that comparatively few sailors can swim. Most shipmasters say that the percentage of non-swimmers among sailors is easily 70 or 80. At one time, according to Navy statistics, 70 per cent of the men in the U. S. Navy could not swim.

But now, according to a Naval press

release, the men are being taught while on southern cruises. This is a good move on the part of the Navy. They evidently realize that in the next war there may easily be as many of their sailors paddling about in the water as there are aboard the ships which are yet waiting to be sunk. Any young man joining the Navy for the next war is earnestly advised to go and purchase a set of water wings.

**THIS** department's Special Correspondent in the Pacific sends the following hot item on aviation in Japan: "Some time ago a gnuspaper in Osaka bought a Ryan, and decided that if Lindbergh got to Paris in a regular sized Ryan, why, they should get to Seattle if it were a trifle bigger. So they took a good look at that Ryan, measured it all up, and enlarged it. Now they are happy—or were happy, I should say. They had an airplane 'built and designed in Japan.' Naturally, only a Japanese motor would be fitting and proper. So in went a nice big heavy 12-cylinder water-cooled motor. Looked somewhat like an old Liberty that had been badly tampered with by a blacksmith. Also two nice big side radiators only weighing about 140 pounds each and holding about 20 gallons of nice light water, also a few rods of nice heavy pipe that you couldn't even dent with a sledge hammer. When they took off, they found that they had overlooked the fact that the Ryan was designed for an air-cooled job. Hence the nose was a little heavy—so heavy that it wouldn't stay up. Now any good airplane designer knows that if the nose is too heavy, then the tail must be too light. So they put 142 pounds of nice lead in the tail. Just made things dandy. Except when the 'pile-it' landed, the tail cracked on the ground and parted from the rest of the ship. Now the firm belief is that Mr. Ryan misled them into building a ship so as to kill the poor Japanese pilots. And in addition to that, they found out that they could carry gasoline only for 18 hours, and it's farther than that to Seattle. So you and Brisbane stop worrying about a Japanese aerial invasion."

**ONE** hundred and two years ago the Mohawk and Hudson Railroad was granted a charter by the State of New York. The primitive line, only 17 miles long, was the beginning of the New York Central. It had one engine and three cars—converted stage coaches. Today the New York Central Lines alone, including what were originally 560 companies, aggregate 12,095 miles. In the United States today are 418,000 miles of track, over which are run 68,000 locomotives, hauling 2,415,000 freight cars and 57,000 passenger-train cars. At a conservative estimate, the total valuation of this property, including stations, freight depots, docks, tugs, ferries, yards and other equipment is over 25 billions of dollars. Who could have thought of figures like that as they rode in one of those primitive coaches drawn from Albany to Schenectady by the old "De Witt Clinton" on August 9, 1831? It wouldn't have seemed possible. In fact, some of the



passengers doubted that the train would get to Schenectady. It got there, but a horse and buggy that started the same time got there first.

We don't know any more about the future of the aviation industry to-day than the passengers on that first train could know about the future of the railroads. Possibly what has been accomplished to date compares with what will be here a hundred years from now on lines somewhat similar to a comparison drawn between the railroad of 1831 and the railroads of to-day. We are just at the beginning of things aeronautical.

**S**PECIAL despatch to AERO DIGEST from Baron Buttonoff, leader of the Cy Caldwell Foundation Expedition to the South Pole. The Baron, it will be remembered, is a nephew of Yukin Pullispantsoff, and a former associate of Ivan Orfulitch, both of whom held high positions under the late Czar of Russia. One of them was a steeplejack and the other was a second story worker. Baron Buttonoff unfortunately escaped with his life during the revolution and smuggled himself into this country disguised as a case of caviar with the lid off. He is a man of great courage, drawn mostly from *vodka* which he drinks by the *hodka*. His despatch follows:

"Bay of Whales, North of South Pole.—If you expect me to stay down in this hole for two years, you better send some new men. I'm getting sick and tired of looking at the old ones. What would I give right now to be able to pass a few wise cracks to a pretty waitress in Childs. She wouldn't even have to be pretty. And you better ship me a new boy scout. This one's voice is changing, and if it's anything I can't stand it's a kid talking soprano one minute and cracked bass the next. Send me a soprano or tenor boy scout, and if he plays the saxophone tell him to leave it in Hoboken. I have troubles enough here now.

"Say, whoever drew the maps of this bay were looney, or something. You can tell the world, at so much per word, that instead of this bay turning to the left after it goes South two yards, it turns to the right after it goes North seventeen feet. I consider this a most important discovery, and I want credit for it. I'm not going to let Byrd and Wilkins get away with publicity on map changing without changing one or two myself. If one of those boys discover something one day, the other discovers something else the next day. And their discoveries are equally important to a man trying to get cross-town on a 42nd street car.

"Last night I saw the Aroarer Bores Me, Alice, or however you spell it. Either I saw it or that last shipment of gin was queer. Better have the next lot tested—try it out on the Quiet Birdmen. If none of them become permanently quiet, ship the stuff. Otherwise give it to your undertaker as a donation from this expedition. He can use it for embalming fluid. And say, I saw a whale over the port bow—or perhaps it was over the other bow. I forget the name of the other side of the boat, but it's the opposite side to the port side. Either I saw that whale or I've got infected teeth which are poisoning my system, so don't forget that gin, because I don't want to lose my eye-sight down here. Not that there's a damn thing to see, but a couple of Eskimo girls dropped in last night, and they don't look near as bad to me now as they did six months ago. I was quite charmed at the dainty way in which one of them gnawed a hunk of raw salt pork. Send me some more raw salt pork—about four barrels of it—and a few pails of lard, as I expect to do a little light entertaining during the winter. And you might include a pair of smoked glasses with tortoise shell rims, and a bottle of perfume.

Any good strong kind will do. But it has to be strong. And don't forget the gin."—Signed, Buttonoff, Commander, Cy Caldwell Expedition. All rights reserved, including the Scandinavian.

**T**HE postoffice officials estimate that more than one billion dollars are taken each year from gullible suckers for fake stock promotions. In the past the favorites of the fakers were gold mines and oil promotions. But now all over the country fake airplane and dirigible companies are springing up to separate the nit-wit from his coin.

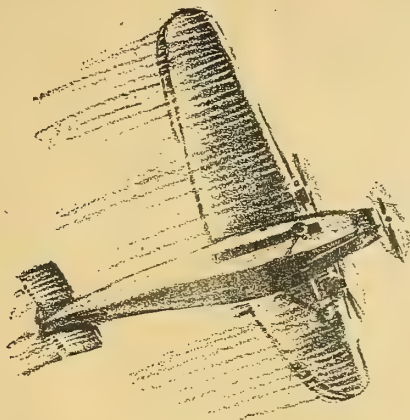
I have before me a circular describing a machine apparently designed expressly to pry money out of suckers. It can land on any road 30 feet wide, fold its wings, and then operate down the street like an ordinary automobile. The promoters suggest that in a year the streets of our cities will be crowded with these things, and they'll be so common that even horses and old admirals won't shy at them, and furthermore: "A holding syndicate is being formed to perfect working models, complete the patent papers, and to formulate plans for the organization of a permanent producing company sufficiently capitalized to manufacture the machine in any quantities. There will be openings for mechanics, pilots, salesmen, office help, and all kinds of skilled and unskilled labor. *Members of the Holding Syndicate will be selected to fill these positions as they develop.*"

It should be obvious to the most simple moron that such a promise is made solely to induce the scatter-brained to invest his money in the hope of getting a job. It should be obvious, but it isn't. The circular concludes: "A small investment in an industry so young and undeveloped and with such a wonderful future might be the stepping stone to future employment and an independent fortune."

It might. Pigs *might* fly, too—only they don't. It should be borne in mind that any reputable aviation business can interest all the capital it needs without pretending to offer a job for the money. Whenever any such bait is dangled before an investor, the bait is tainted; and whoever bites is a sucker, pure and simple—and four times as simple as he is pure. There is only one reasonably safe way to buy aviation stock or any other kind of stock. Go to your banker or to any reliable investment house and get their opinion of the issue. If they don't advise you to buy, don't buy. And if you buy, remember that the stock of any new legitimate company, whether airplane or grocery, is a speculation, not an investment. The new business may make money, or it may not. It may honestly succeed or honestly fail. A moderate proportion of anyone's savings might be put wisely into some airplane business, with the hope of profit and the expectation of possible loss. But no one should invest in the stock of any new business who is not prepared to stand loss. There is no guarantee that any new business will make money; the only guarantee that an established business will make money in the future is its record in the past. And new businesses have no past. They are plain speculations. The promotion I described is not even a speculation. It is a certainty that the sucker will lose.

I repeat my advice, though experience tells me that few will follow it: Before you turn over your money to anyone, consult a banker and be guided by what he tells you. Don't be a sucker—the subway's crowded with them now.

**F**OR decades the public executioner of Berlin, Germany, has worn evening dress while decapitating the condemned—possibly to give an (Continued on page 214)



In the very heart of  
the World's Greatest  
Aeronautical Market

# **NEW YORK AVIATION SHOW**

**FEBRUARY 6<sup>TH</sup>-13<sup>TH</sup>**

**EDUCATIONAL  
INSPIRATIONAL  
ENTERTAINING**

# **GRAND CENTRAL PALACE**

Held under the auspices of  
AVIATOR'S POST No. 743, AMERICAN LEGION  
in cooperation with the leading civic and educational organizations.



# COMMERCIAL AVIATION IN SOVIET RUSSIA

By V. Zarzar

*Chief Inspector of Commercial Aviation in  
the Union of Socialist Soviet Republics*

THE development of commercial aviation in the U. S. S. R. dates from the establishment of the first regular airlines in 1922. Since that time, the activities of Soviet aviation have expanded rapidly from year to year. Although in 1922 the length of air mail and passenger lines was only 1,200 kilometers (745 miles), by July, 1928, this figure had grown to 11,427 kilometers (6,985 miles). The number of passengers carried increased from 276 in 1922 to 7,079 in 1927, while the amount of mail and parcels carried increased from 13,750 kilograms (30,250 pounds) to 170,381 kilograms (374,838 pounds) during this period.

In 1922, the first commercial air company, the Deruluft (joint Russian-German enterprise), was organized for the purpose of establishing air service between Moscow and Koenigsberg (Germany). Three Soviet companies were organized in 1923, the Dobrolet (Volunteer Air Fleet), Ukrvozdukhput (Ukrainian Airways) and the Zakavia (Transcaucasian Aviation), the latter being liquidated in 1925.

Of the three companies at present in operation in the territory of the U. S. S. R., the Dobrolet, is by far the largest, the length of its lines aggregating 5,862 kilometers, (3,635 miles) more than 50 per cent of the total length of the airways in the country. The Dobrolet at present confines its activities to outlying districts in Central Asia and Siberia where, due to the lack of railroad transportation facilities, commercial aviation is of especial importance. It operates the Irkutsk-Yakutsk line in Siberia, with a branch route to the Bodaibo gold region, and the Tashkent-Samarkand-Termez-Dushambe, Tashkent-Kabul (Afghanistan), and Frunze-Alma-Ata lines in Central Asia.

Ukrvozdukhput operates airlines 2,920 kilometers (1,810 miles) in length, the main line connecting Moscow and Pekhlevi (Persia), with stops at Kharkov, Rostov-on-Don, Mineralny Vody and Baku. The airlines of Deruluft total 2,645 kilometers (1,650 miles), the two main routes being Moscow-Riga-Koenigsberg-Berlin and Leningrad-Reval-Riga, the capital of the state of Latvia.

This network of airways is far from adequate for the needs of a country of the tremendous area of the Soviet Union. However, the record of the last few years has been one of rapid and continuous progress, as can be seen from the following table giving the principal statistics for commercial aviation in the U. S. S. R. during the period 1922-

air transportation facilities in the Soviet Union is the fact that in 1927, although the mileage of air routes increased only 10 per cent and the mileage flown, 38 per cent over the previous year, the number of passengers increased more than 75 per cent and the mail carried, 102 per cent. Service on the Soviet airlines is almost invariably punctual, the flights being on schedule 90 per cent of the time, which is an excellent record for air transportation.

	Length of Airlines (km.)	Kilometers Flown	No. of Pass.	Letters and Parcels Carried (kilgr.)
1922 ...	1,200 (745 m.)	134,000* (83,080 m.)	276	13,750 (30,250 lbs.)
1923 ...	1,610 (998 m.)	377,710 (234,180 m.)	1,433	27,885 (61,347 lbs.)
1924 ...	4,400 (2,728 m.)	541,764 (335,884 m.)	2,618	48,309 (106,280 lbs.)
1925 ...	4,984 (3,090 m.)	894,539 (554,615 m.)	3,398	76,789 (168,936 lbs.)
1926 ...	6,392 (3,963 m.)	1,313,130 (814,141 m.)	4,035	84,561 (186,034 lbs.)
1927 ...	7,022 (4,354 m.)	1,817,952 (1,027,130 m.)	7,079	170,381 (374,838 lbs.)
1928 July 11, 427	(6,985 m.)			

The number of accidents on the lines has been very small. During the past two years (1927-1928), there were no fatal accidents, while in the period 1924-1926, there were two mishaps resulting in three fatalities. During the past five years of operation of the Soviet airlines, there has been an average of one fatality for every 2,500,000 kilometers (1,550,000 miles) flown. Dobrolet has not had a single fatal accident in all the years of its activities, which is an especially singular achievement in view of the fact that the company operates in regions which offer many perils to aviation. This record of safety is due largely to the experienced and well-trained staff of Soviet airmen.

Other branches of commercial aviation in which considerable progress has been recorded include aerial photography and dusting of crops with insecticides. In the fiscal year 1924-25, Dobrolet photographed an area of 5,300 square kilometers (2,014 square miles), increasing the area to 17,000 square kilometers (6,460 square miles) in 1925-26 and to 25,000 square kilometers (9,500 square miles) in 1926-27.

Aerial photography is utilized in mapping, forest cultivation, industrial construction and for the needs of the Central Statistical Administration in estimating crops.

Dusting of crops was started on a large scale in 1925-26, when a total area of 25,000 acres was



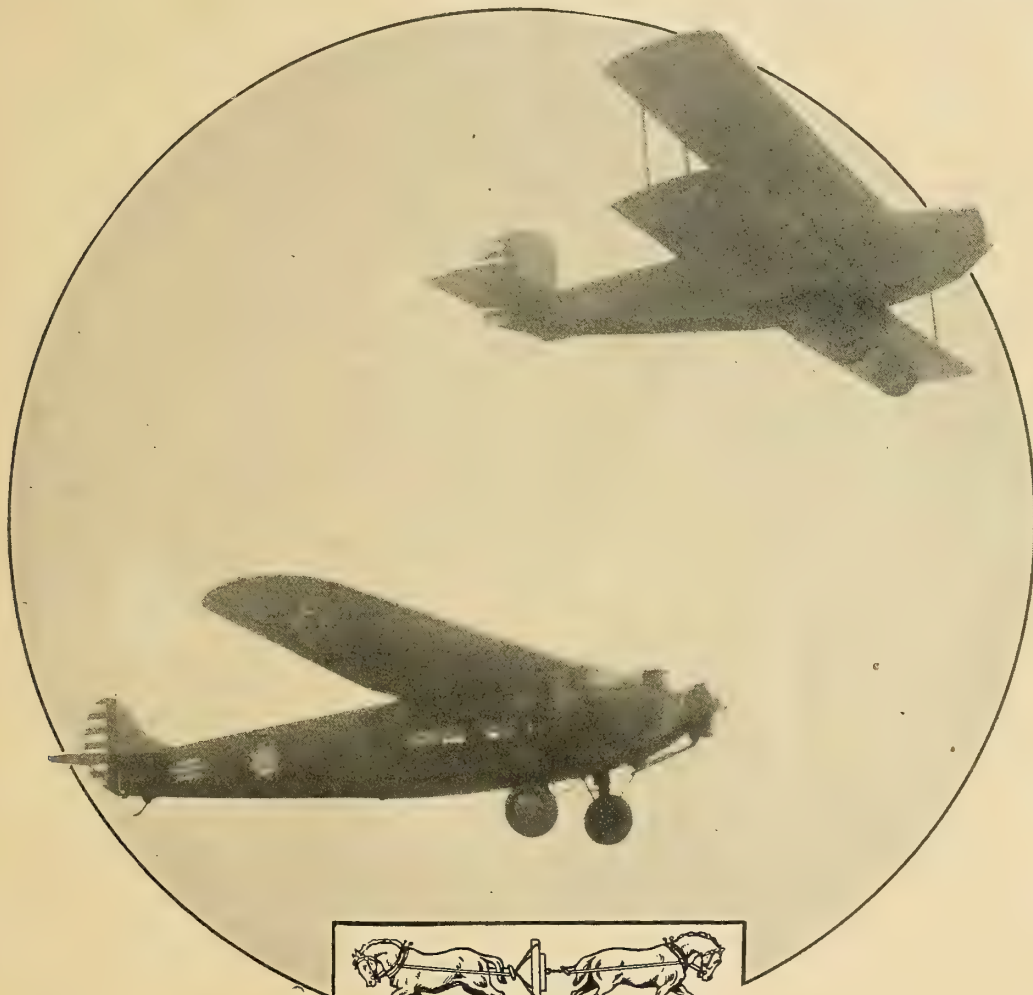
A Junkers plane of the Dobrolet line at Samarkand, Central Asia

sprayed with insecticides. This figure was more than trebled in the following year when 77,000 acres were sprayed. Experiments in dusting forests against pests are now being conducted. So far this experimental work has brought favorable results.

During the past few years, Dobrolet has successfully demonstrated an interesting new use for airplanes—that of aiding hunters and trappers in the White Sea region by locating the animals from (Continued on page 220)

An indication of the increasing use being made of the

# 150 HOURS, 40 MINUTES— and not a structural failure!



## WATERPROOF GLUE

Hats off to the "Question Mark"—her crew, designer, builders and suppliers, and to those who participated in the remarkable feat of refueling her! 150 hours, 40 minutes in the air without touching her wheels to the ground—a test of strength if ever there was one.

We take great pride in announcing that Casco

Waterproof Glue was used on the "Question Mark," (as on all Fokkers) throughout its construction. The heat of the California sun, the cold of West Coast nights, continuous motor vibration, fog . . . none of these could tear apart those surfaces which Casco Waterproof Glue held together.

### IMPORTANT TO AERO ENGINEERS

*Requests on business stationery will promptly bring the new Casco Red Book, a handy reference manual of practical gluing methods*

**THE CASEIN MANUFACTURING COMPANY**  
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# THE QUESTION MARK'S FLIGHT

AT the time the *Question Mark* was still soaring over the coast of Southern California, and newspapers throughout the country were running flash headlines about it, a great many people were amazed at the apparent ease and casualness with which the feat was being performed. As a result of this impression, prolific predictions for the future of refueled flight appeared on every horizon. Announcements quickly came forth of proposed non-stop flights around the world and regular non-stop coast to coast air transport service in the immediate future. Most everyone seemed to forget that, although the remarkable performance of the *Question Mark* undoubtedly foretells important developments in flying, this particular flight was accomplished only after the most careful preparation.

The War Department did not publicly announce the endurance attempt until extensive tests had proved its feasibility. Nothing was left to chance. Not only was every precaution taken to have the plane and its three engines as flawless as possible, but also the special equipment needed had to be determined, installed and tried out.

On a flight of such long duration, the comfort of the crew was an important consideration. Towards this end, three sleeping berths, two wicker chairs and other items contributing to comfort were included in the cabin. Two of these berths were built over the gasoline tanks in the cabin; and the third, over the oil tank.

Although the refueling apparatus used represents a rather cumbersome stage of what will probably be the future development of such equipment, it was nevertheless well suited to the work at hand. The Douglas C-1 refueling planes carried two 150-gallon gasoline tanks and one 40-gallon oil tank. A 50-foot hose, with a diameter of two and a half inches, was lowered from the refueling plane to the *Question Mark* for the transfer of fuel. During the refueling periods, Major Carl Spatz, in command of the flight, stood on a special platform in the entrance compartment of the endurance ship, where he caught the hose as it came down from the plane above and pulled it through the opening to the tanks be-

By Robert B. Renfro



low. This opening was placed well to the ship's rear to reduce as much as possible any hazards from the engines or propellers.

A special catwalk and platform arrangement was built on the outside of the plane so that the engines might be reached while in flight. The catwalks, braced to the upper longerons and nacelles, led from a door on each side of the fuselage to the right and left engines. Around the nose of the plane, a platform was built to afford access to the front engine.

These features of equipment are mentioned merely to emphasize the care and precision with which the flight was planned. After all, the feat of the *Question Mark* was not a casual

thing; it had the working organization of the Army Air Corps as a foundation upon which to build. At the present stage of development, it is safe to predict that no one who lacks that or something equally efficacious will be able immediately to surpass the splendid record which the Army established in this flight.

But to say that more remarkable flights than that of the *Question Mark* will not be made *immediately* is not to say that they will *never* be made. Someday, perhaps not far distant, some one will fly non-stop around the world and regular non-stop coast to coast air service may be in operation,—both by means of refueling. Such things will be possible, however, only when processes of refueling are perfected and adequate provision is made for the repair of engine troubles during flight.

The flight of the *Question Mark* is a magnificent, even if pioneering, stride in that direction. There are two aspects of aviation which can and will earn it a distinctive and superior place among all the forms of transportation which mankind has evolved thus far. The one is speed; the other is radius of activity. Flying has already surpassed everything in the matter of speed. But even so, further research and study will undoubtedly result in improvements in airplane and engine design which will continue steadily to increase the speed of flying.

That greater distances will be flown is clearly evinced by the performance of (*Continued on the next page.*)



The Army's Fokker endurance plane, "Question Mark," with three Wright Whirlwind engines.

© R. C. Talbott.



There's No  
 "Question Mark"  
 about their Gasoline  
 —it was  
**RICHFIELD**

**B**REAKING every known record for duration and distance, the *Question Mark*, famous tri-motored Fokker of the U. S. Army, landed at Metropolitan Field January 7 at 2:07:01 p.m.—150 hours 40 minutes and 14 seconds after her thrilling take-off from the same field at 7:26:47 a.m. New Year's day.

? ? ?

#### RECORDS BROKEN

##### ENDURANCE FLIGHTS

*Airplanes, Refueled, Grooy and Groenen of Belgium* 60 hours, 7 minutes.

*Airplanes, not Refueled, Risticz and Zimmerman of Germany*—65 hours, 25 minutes.

*Dirigibles, French Dixmude, 118 hours; Graf Zeppelin, 111 hours.*

*Spherical Balloon, Kaulen of Germany*—87 hours.

##### DISTANCE FLIGHTS

*Airplanes, Ferrarin and Del Prete of Italy, Italy to Brazil* 4417 miles.

*Dirigibles, Graf Zeppelin, Friedrichshafen, Germany, to New York* 6000 miles (estimated).

? ? ?

#### PERSONNEL

Major Carl Spatz, Commander; Chief Pilot, Capt. Iva Eaker; Relief Pilots, Lt. H. A. Halvorsen, Lt. Elwood R. Quesada, and Sergeant Roy W. Hooe.

? ! ?

Richfield used in the "Question Mark" is the same famous aviation gasoline that captured four of the six major events in the National Air Derby, the fuel used by Capt. Wilkins on his record-breaking dash over the North Pole—the choice of Art Goebel for his transcontinental non-stop record—the fuel that has won more victories and world's records than all other gasolines combined. Use Richfield in your own car—easy starting—power, speed and mileage combined—the finest gasoline you can buy.



(Continued from preceding page) the *Question Mark*. By keeping the trimotored Fokker in the air for total of 150 hours 40 minutes and 15 seconds, the Army pilots have proved that modern planes and engines have sufficient stamina for extended flights. It is significant that, in this flight, the airplane has again proved the quality of its design and construction. In the final analysis, the engine troubles were very minor. After running continuously for more than six and a quarter days under actual flying conditions, the three Wright 225 horsepower Whirlwinds, upon being dismantled, revealed some wearing of the rocker arm bushings and rocker arms. This was due to their becoming overheated, for they were not automatically oiled. Plugged grease outlets had also caused the valve push rods in the left engine to wear and were responsible for the trouble which finally caused the plane to land. These difficulties are probably not irremediable. Certainly this recent record flight did not fail to produce once more convincing evidence of the reliability of modern aircraft in protracted flight.

What, then, about distance, which truly is the most important aspect to be considered? It is estimated that the *Question Mark* covered at least 11,000 miles. In the official records, however, no credit is given for approximately 75 per cent of that distance because the plane did not remain upon its designated course. Its official course lay between the Los Angeles Metropolitan Airport and Rockwell Field at San Diego, a distance of 128.5 miles. For various reasons but mainly because of unfavorable weather, the crew of the plane did not deem it advisable to attempt to follow that route throughout the flight. They were even compelled on one occasion to pilot their craft over to the Imperial Valley.

These divergences from the prescribed course cannot properly be overlooked. We may admire the flight for the tremendous distance actually covered, but we must remember at the same time that few flights are of value to military operations or to commercial air transportation which do not reach pre-determined destinations. Except for demonstration, testing and record-breaking purposes, the plane which does not fly as directly and swiftly as possible to its destination, no matter how long it may remain in the air, has accomplished little of practical significance.

One should not imagine, however, that the flight of the *Question Mark* is any the less admirable because it did not consistently follow its course. Yet it is well to recognize, and if possible overcome, those factors which act as deterrents to direct long-distance flying. Progress in meteorology, fog flying and methods of refueling in the

air will undoubtedly do much toward eliminating these apparently recalcitrant factors. But the immediately important thing which the *Question Mark* has demonstrated is that protracted flight in modern aircraft by means of refueling is entirely practicable. Ability to remain in the air for prolonged periods is an essential element in long-distance non-stop flying, military or commercial. The Army Fokker has contributed greatly in that respect,—enough, in fact, to justify its endurance attempt many times over.

How much this practical experience in refueling may mean is not difficult to see. The transfer of gasoline, oil and supplies from one plane to another is much more precarious than it seems. If the hose should come too near the propellers or if gasoline should accidentally spray on the hot engines, very serious consequences might result. In one instance during the flight, the gas did spray over the



© R. C. Talbott.

The personnel of the "Question Mark" flight—Left to right: Sgt. Roy Hooe, (Chief Mechanic), Lt. Thomas, (Ground Engineering Officer), Lt. Elwood R. Quesada, Lt. Harry A. Halverson, Capt. Ira Eaker, (Chief Pilot) and Major Carl Spatz, (Flight Commander).

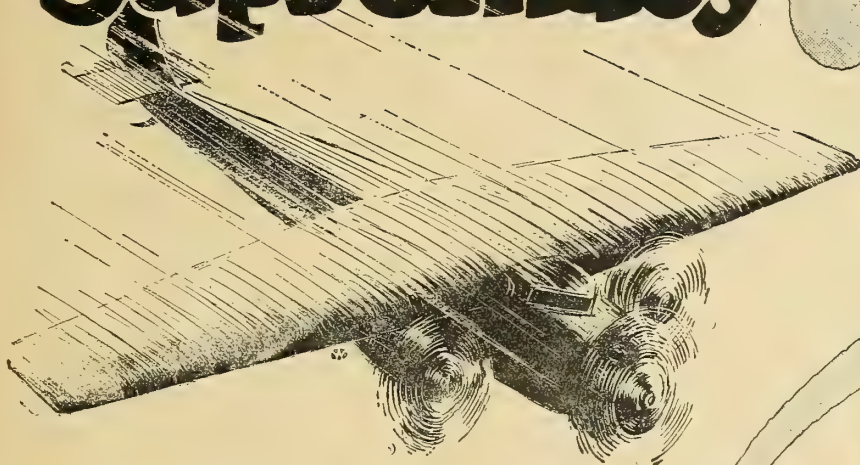
plane, and Major Spatz narrowly escaped injury. On the whole, however, the Army fliers definitely established the practicability of refueling, as such. They accomplished that operation under the widest variety of conditions. If the ship was to continue flying, the transfers had to be and were carried on at night, in rough air, in fog and in sun. One contact, lasting seven minutes, was made at night when all the ship's lights were out after the batteries had run down. Although there was no rain, these men had already successfully refueled in rain at Washington. The greatest difficulty, of course, was in refueling in bumpy air. Both planes would not always settle at the same time. When the refueling ship would get ahead, hit a bump and send its propeller wash back on the *Question Mark*, one plane would sometimes go one way and one another. Nevertheless, even with their crude apparatus, the Army pilots continually made contacts in spite of weather or darkness. Taking over a total of 5,150 gallons of gasoline, 250 gallons of oil and 2,000 pounds of supplies, they refueled successfully thirty-seven times during the entire flight. There were approximately 4 hours of contact flying altogether. Warm meals, telegrams, letters, a wash basin and towels, a window glass to replace the one blown out, and numerous other items were transferred.

What does this splendid achievement portend for the time when we shall have a greater wealth of experience with refueling and more refined apparatus for it?

The suggestion has been made that, once refueling becomes generally practiced, the wear and tear imposed on planes by frequent landings and take-offs will be greatly reduced, and that planes will therefore have longer life and be less costly to maintain.

Refueled flight will be a (Continued on page 240)

# Army Flyers Win World Supremacy



**"Question Mark" 150½ hr. flight is  
hardest test ever given a Motor oil.**

The amazing success of the giant "Question Mark" in breaking all endurance records earns signal honors for Major Carl Spatz and his crew. Their achievement—opening up a new and vast field for aviation progress—adds one more triumph to the brilliant record of the Army Air Service.

To lubricate the great Wright Whirlwind engines in this, the severest test ever given a motor oil, the finest lubricant obtainable was an imperative requirement. Recognizing this fact, the Army Air Service purchased Pennzoil—and its performance once more proved the Supreme Quality of Pennzoil.

THE PENNZOIL COMPANY, Largest Refineries Operating on 100% Pure Pennsylvania Crude Oil Exclusively. Executive Offices: Oil City, Penna. Los Angeles, Calif. Refinery: Oil City, Pennsylvania.

**SUPREME  
PENNSYLVANIA  
QUALITY**

# PENNZOIL



**SAFE  
LUBRICATION**

*They turned the  
"Question Mark"  
into an  
everlasting  
Exclamation Point!*



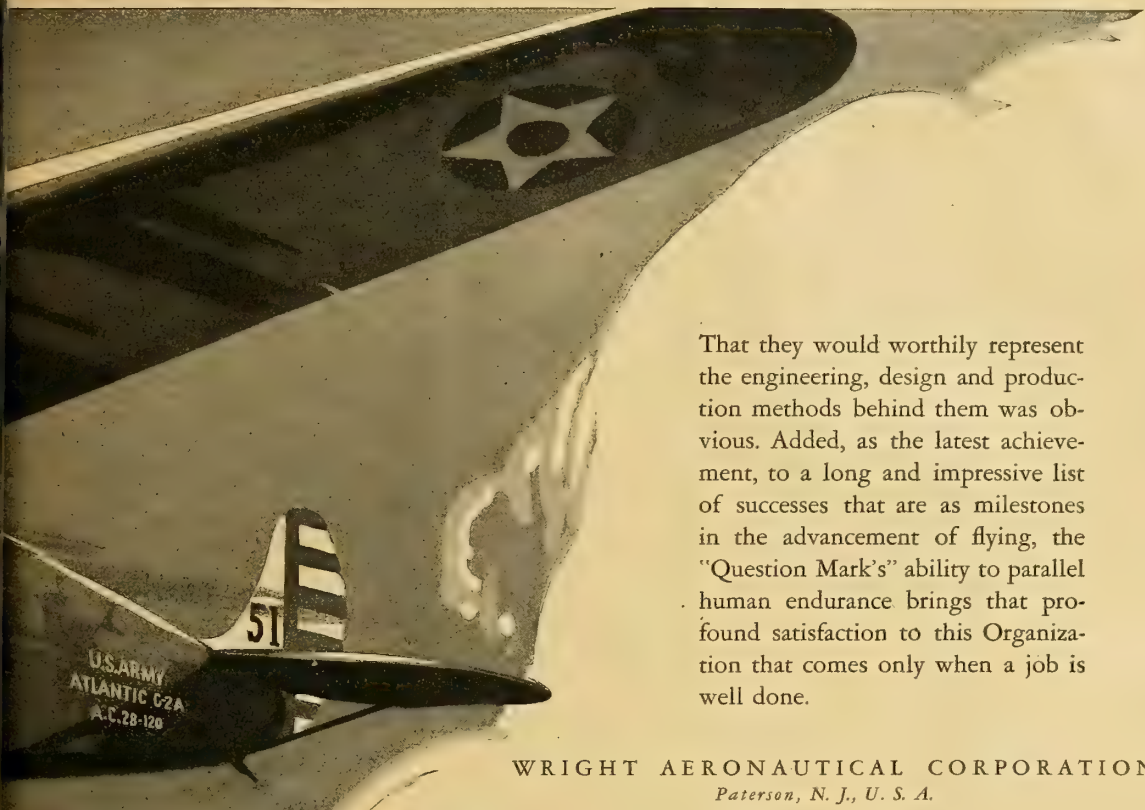


EQUIPMENT . . . 3 Wright Whirlwind J-5 Engines of 200 H. P. each  
 FLIGHT STARTED . . . (Pacific Coast Time) 7:20 A. M., January 1st  
 FLIGHT ENDED . . . . . 2:07 P. M., January 7th  
 DURATION OF FLIGHT . . . . . 150 hours, 43 minutes  
 GASOLINE CONSUMED . . . . . About 5205 gallons, total  
 OIL CONSUMED . . . . . About 262 gallons, total

*At the termination of the flight, it was only necessary to make minor adjustments to bring the engines again to perfect condition.*

WITH the completion of the remarkable flight of the United States Army tri-motored Transport plane, "Question Mark", Wright Whirlwind Engines round out a record of achievement for 1928 and inaugurate a standard of performance for 1929 that will carry aviation on to still greater success.

Wright takes an honest pride in the performance of the three J-5 Whirlwinds that have completed this epochal test.



That they would worthily represent the engineering, design and production methods behind them was obvious. Added, as the latest achievement, to a long and impressive list of successes that are as milestones in the advancement of flying, the "Question Mark's" ability to parallel human endurance brings that profound satisfaction to this Organization that comes only when a job is well done.

## WRIGHT AERONAUTICAL CORPORATION

Paterson, N. J., U. S. A.

*Practically all of the record flights made by American aviators during 1927 and 1928 were accomplished with Wright Whirlwind Engines, including the following:*



DATE	PILOT and CREW	POINT of DEPARTURE	DESTINATION and POINT of LANDING
May 9, 1926	Comdr. R. E. Byrd, Floyd Bennett	Spitzbergen	Over North Pole and back to Spitzbergen
May 1927	Charles A. Lindbergh	San Diego	St. Louis
		St. Louis	New York
		New York	Paris
June 5-6, 1927	Clarence Chamberlin, Charles A. Levine	New York	Eisleben, Germany.
June 29-30, 1927	Comdr. R. E. Byrd, Bert Acosta, Bernt Balchen, Lieut. G. O. Noville	New York	Ver-Sur-Mer, France
June 28-29, 1927	Lieut. Lester Maitland, Lieut. Albert Hegenberger	Oakland	Wheeler Field, Hawaii
Aug. 16-17, 1927	Art Goebel, Lieut. Davis	Oakland	Wheeler Field, Hawaii
Aug. 27-Sept. 14, 1927	William Brock, Edward F. Schlee	Harbor Grace, N. F.	Croyden, England, thence across Europe & Asia in series of flights to Tokio, Japan.
Dec. 13, 1927 to Feb. 8, 1928	Col. Chas. A. Lindbergh	Washington, D. C.	Mexico City (Pan American Tour)
Jan. 12-14, 1928-Feb. 1-3, 1928	Major Louis Bourne, Lieut. Geo. C. Towner	Anacostia, D. C.	Miami, Fla., thence non-stop to Managua, Nic.
Apr. 15-21, 1928	Capt. G. H. Wilkins, Carl Eielson	Point Barrow, Alaska	Over the North Pole & back to Spitzbergen.
May 31-June 9, 1928	Capt. Kingsford-Smith, C. T. P. Ulm, James W. Warner, Harry W. Lyon	Oakland	Wheeler Field, Hawaii, thence to Suva, Fiji, and Brisbane, Australia.
June 17-18, 1928	Amelia Earhart, Wilmer Stultz, Louis Gordon	Trepassy, N. F.	Burryport, Wales
Aug. 1928	Capt. Kingsford-Smith		First non-stop flight across Australia, 1950 miles.
December 1928	Capt. George Wilkins		First flight over Antarctic Sea to within few miles of South Pole & return to base.
January 1929	Major Spatz		151 hours continuous flight by "Question Mark."

# WRIGHT

*The first name in flying*

CANADIAN WRIGHT LIMITED, Sole Licensees for Canada, Montreal

Authorized Parts Dealers—Air Associates, Inc., Curtis Field, Long Island, N. Y. Pacific Aeromotive Corp., Los Angeles, Cal. Stout Air Services, Inc., Dearborn, Mich.





The  
Question  
Mark.



..... and  
**MICARTA**  
REG. U. S. PAT. OFF.  
**PROPELLERS**

ONCE more Micarta propellers have demonstrated their trustworthiness by carrying to a successful conclusion the endurance flight of the Question Mark.

Micarta propellers already are well known through the fame won by the flight of the Southern Cross to the Antipodes and also by two other planes that made the hop from San Francisco to Hawaii.

Micarta is a phenolic laminated material from which are made propellers that are strong, but of light weight; free from vibration and chatter; immune to damage from salt spray, moisture and oil, and of high efficiency.

Pulleys, fair-leads, aileron, elevator and rudder hinges, and tail wheels also are made of Micarta.

Ask our nearest office for complete information.

Westinghouse Electric and Manufacturing Co.  
East Pittsburgh Pennsylvania

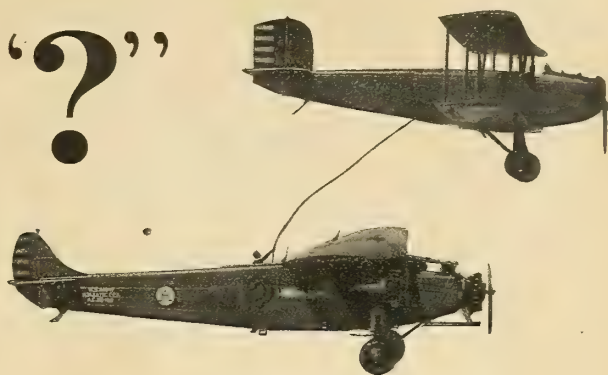
Sales Offices in All Principal Cities of  
the United States and Foreign Countries



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# Flight of the "?"

Greatest demonstration  
of stamina in the air

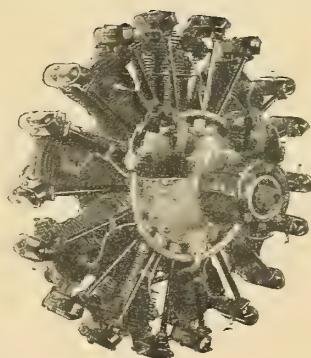


**SCINTILLA** Aircraft Magnetos  
produced 376,650,000 sparks  
during nearly a week in the air

BY refueling in mid-air the tri-motored Army Plane "Question Mark" recently set a record for sustained flight of 150 hours. The Fokker-Wright-Scintilla combination emphasized more than ever the meaning of the word "dependability." In addition to their reliability, Scintilla Magnetos are simple in construction and accessible for inspection and adjustment.

These characteristics apply to every type and size of Scintilla Magneto.

The record of the gruelling flight of the "Question Mark" speaks convincingly of the thoroughness with which each Scintilla Magneto is inspected and tested before it leaves the plant.



The Wright Whirlwind, three of which carried the "Question Mark" to its epochal record of 150 hours. SCINTILLA MAGNETOS are standard on every class of Wright Engine.



**SCINTILLA MAGNETO CO. INC.**  
**SIDNEY - NEW YORK**

Contractors to the U.S. Army and Navy



# THE NEW YORK AVIATION SHOW

under the auspices of Aviators' Post No. 743, American Legion

THE New York Aviation Show, to be held at the Grand Central Palace from Wednesday, Feb. 6th, to Wednesday, Feb. 13th inclusive, is designed to stimulate air-mindedness and to acquaint the people of the New England and North Atlantic states with the advantages of air travel and air mail as time saving and economic mediums. The show will be open daily from 11 a. m. to 10:30 p. m.—on Sunday the show will open at 1 p. m. No broadside of aeronautics has been on view in New York City since 1921. Since that time, the greatest advances have been made in aviation engineering and design, and although the Metropolis has been the center of much activity in the development of modern aircraft and flying fields and has served as a terminal for a number of trans-Atlantic flights, the public in that region is relatively unacquainted with the physical progress that this science has made.

With ten mayors of upstate New York cities included in its membership, the next session of the New York Aviation Conference will be held in New York as a result of the efforts of Mayor James J. Walker and Commander John Dwight Sullivan, chairman of the Legislative Committee of the Conference.

The program arranged for the entertainment of the guests includes a luncheon at the St. Regis, which will be attended by celebrities of the aeronautical world, as well as by members of the Conference. After the luncheon, the delegates will visit the show. Mayor Walker's invitation was transmitted to Mayor Hanna by Mr. Sullivan, and all arrangements for the delegates to come to New York have been completed. Mayor Hanna is president of the Conference. Other officers include Peter J. Brady, vice president; L. R. Mack of Albany, secretary. Former United States Senator James W. Wadsworth, Jr.; Major General John F. O'Ryan; Oliver James, deputy attorney general; Mayor John Boyd Thacher 2nd, of Albany; and Mayor Frank X. Schwab, of Buffalo, are prominent in the activities of the Conference.

A model airplane contest will be conducted at the 71st Regiment Armory a week before the opening of the show. The appeal which the competition has made to the public is indicated by the fact that more than 2,500 prizes for award to the boys participating have been received by the committee. The winning planes and prizes, together with 300 scale models, will be exhibited at the show, where the awards will be made by flying celebrities, among whom will be Clarence Chamberlin, trans-Atlantic pilot; Miss Amelia Earhart, first woman trans-Atlantic flier; and Miss Eleanor Smith, one of our youngest licensed pilots. The executive committee for this event consists of A. W. Garrett, Board of Education Bureau of Vocational Activities; B. Hubbell, Junior Aviation League of Brooklyn; Arthur Moren, Playground and Recreation Association of America; Thomas C. Evans, assistant publicity director of Gimbel Brothers; and George F. McLaughlin, technical editor of AERO DIGEST.

Radio will be used intensively to boost further the cause of aviation. Before the exposition opens, Aviators' Post will present daily over stations WGBS, WOR, and station WMSG, short talks on those phases of aviation which will be most entertaining and instructive to the radio fans. During the exposition, there will be a broadcasting station in a glass studio, from which many prominent persons

attending the show will address the radio audiences.

As a result of an authorization received from Postmaster General Harry S. New, the smallest post office in the world will be situated on the main floor officially to handle air mails in connection with the show.

In Lady Heath's "Women's Aviation Corner," apparel and flying clothes for women will be on display. Many noted women fliers who have contributed their skill and daring to this new and brilliant science, will be the background of this exhibit.

Among the official bodies coöperating with the Show are the Museum of Natural History, Board of Education, United States Weather Bureau, Post Office Department, Department of Commerce and the New York State Aviation Conference.

Moving pictures depicting the advance of aviation from the memorable flight of Orville Wright at Kitty Hawk to the present day will be shown in a specially constructed theatre which will seat 200 people.

A formation of planes will fly over the city on the opening day of the show. It is expected that there will be about one hundred planes in the formation.

The exhibits will be divided into three main classifications;—general aircraft displays, including planes, balloons and accessories; airport equipment; and educational and historical displays. The main floor will be devoted almost exclusively to the exhibition of the planes themselves, although a number of accessories booths will be interspersed.

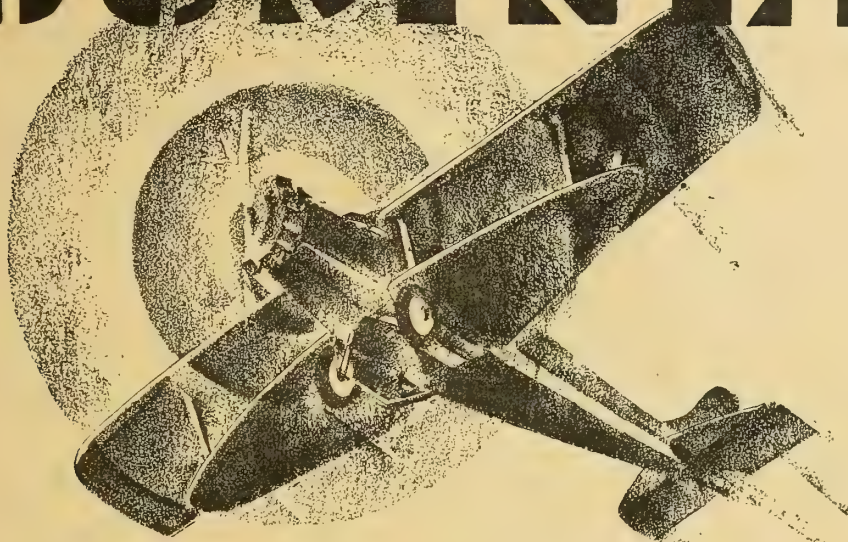
The second floor will be devoted to exhibits of transport companies; airport engineering and equipment; hangar equipment; dope and fabrics; and flying togs. The third floor will accommodate the many educational features, and booths for the flying schools and aeronautical publications.

Particular emphasis is being placed upon the educational features by the Post Exposition Executive Committee, which has reserved space for the various departments of the United States Government. On this floor will also be on view the model planes made during the model plane competition conducted by Aviators' Post in coöperation with the Board of Education of the City of New York.

Several important conferences will be held for airport committees representing municipalities of New England and the North Atlantic states. Provisions have been made for these committees to meet at Grand Central Palace, where they will be addressed by authorities on airport construction. These conferences are expected to add considerable impetus to the actual building of proposed flying fields, and add to the growing business of those companies now devoting themselves to equipping the up-to-the minute airport.

The exposition is to be held under the auspices of Aviators' Post Number 743, American Legion. This Post is composed solely of pilots and observers who served in the United States and Allied armies during the World War, and the membership list includes the names of many noted airmen, among them Major General James E. Fechet, Chief of Air Corps of the United States Army; Captain Eddie Rickenbacker, ranking ace; Captain Elliott White Springs; Major George Vaughn, second ranking American ace, and Commanding Officer at Miller Field, Staten Island; Colonel Harold E. Hartney, former Commanding Officer of the

# BUSINESS



The plane sketched is an eight-place, dual-control, Buhl Senior Air sedan. It is powered with a Wright Cyclone engine, high-speed 140 m.p.h. The cabin is sound-proofed and exceptionally comfortable.

**B**USINESS is now the basis of flying. Gone is the day of experimentation, of stunts, of fluttering flags and cheering crowds. The day of intelligent manufacture to approved design, of sound marketing plans, of administrative policy in accordance with the established rules of profitable enterprise—the day of *business in the air*—is here.

That is why the Buhl Aircraft Company, a unit of the far-reaching Buhl interests with

their background of 95 years of leadership in America's industrial development, is an acknowledged leader. Airline operators, private owners and corporations alike find in the complete line of Buhl Airsedans a plane to meet their every requirement. Those associated in a dealer capacity have a sound connection where factory co-operation and profit are assured. We shall be pleased to mail catalogs or details of our dealer plan.

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EASTERN CANADA  
National Air Transportation, Ltd.  
Toronto, Ontario

# BUHL Aircraft Company

MARYSVILLE, MICHIGAN





First Pursuit Group, A.E.F., among whose distinguished members were Major Raoul Lufberry; Lieutenant Frank Luke; Lieutenant Quentin Roosevelt; Lieutenant Wilbert W. White; Lieutenant Reed Chambers, and others.

The two hundred and eighty veteran aviators of the World War, members of Aviators' Post No. 743, American Legion, communicated to President-elect Hoover an offer of active assistance in supporting any constructive measures advocated by him during his administration which are designed to stimulate aeronautical activities in the countries of Pan-America. Mr. Hoover's sympathetic attitude toward Pan-American development in general, and aeronautics in particular, is substantially the same as the policy recently adopted by the members of Aviators' Post to stimulate public interest in Pan-American aviation. To accomplish this, the Aviation Show has as one of its chief aims the accenting of Pan-American aeronautics.

The annual ball of the Aviators' Post 743, American Legion, will be held on Monday evening, February 11th (Lincoln's Birthday eve) at the Ritz Carlton Hotel,

Madison Avenue, near the Grand Central Palace.

The General Committee of the New York Aviation Show is as follows: Hon. Harry S. New, Postmaster General; Hon. Alfred E. Smith; Hon. Franklin D. Roosevelt; Hon. John H. Trumbull; Hon. James J. Walker; Major General Robert Lee Bullard; Major General James E. Fechet; Major General William Weigel; Rear Admiral William A. Moffett; Rear Admiral Louis de Steiguer; Amelia Earhart; Clarence Chamberlin; Augustus Post; Lady Heath; Lieut. Thomas B. Mulroy, U. S. N. R.; Hon. Royal S. Copeland; Hon. Fiorello H. La Guardia; William C. Heppenheimer; Colonel Lemuel Bolles; Emanuel Cohen; Colonel Walter A. De Lamater; Colonel Harold E. Hartney; Major George A. Vaughn; Martin Jensen; Major William J. Hammer; George H. Sherwood; Hon. John Boyd Thacher 2d; William Randolph Hearst; Captain Eddie Rickenbacker; Bernard Gimbel; Hon. George J. Ryan; Hon. William J. O'Shea; James Kimball; Dr. Frederick L. Hoffman; Dr. Wilbert W. White; Merrill Hamburg; and T. A. Dwyer.

## LIST OF EXHIBITORS AT THE NEW YORK AVIATION SHOW, FEBRUARY 6th TO 13th

### AIRCRAFT EXHIBITS—1st FLOOR

Air Associates, Inc.  
Alexander Aircraft Company  
American Aeronautical Corp.  
Bellanca Aircraft Corp.  
Bourdon Aircraft Corp.  
Brooklyn Air Transport Co.  
Brunner Winkle Aircraft Corp.  
Buhl Aircraft Corp.  
Columbia Air Liners, Inc.  
Crescent Aircraft Corp.  
Curtiss Flying Service, Inc.  
Hamilton Metalplane Co.  
E. H. Holmes & Company  
Moth Aircraft Corporation  
Thomas B. Neelands, Jr.  
New Standard Aircraft Corp.  
U. S. Aircraft Co. of N. J.

### OTHER EXHIBITS—1st FLOOR

American Aeronautical Corp.  
American Cirrus Motor Corp.  
E. W. Bliss Company  
Robert Bosch Magneto Co., Inc.  
Brownback Motor Sales, Inc.  
Buhl Stamping Company  
Continental Motors Corp.  
Eaglerock Aircraft Corp.  
Edo Aircraft Corporation  
Eclipse Machine Company  
Fink, Dumont White, Inc.  
Hamilton Aeronautical Corp.  
Hart Oil & Refining Co.  
Harwen Products Corp.  
Heywood Starter Corp.  
Kinner Airplane & Motor Corp.  
National Aero Corp.  
Nicholas-Beazley Corp.  
Paramount Welded Aluminum Products Corporation.  
Radio Frequency Laboratories, Inc.  
Rand McNally & Company  
Ruggles Orientor Corp.  
Snap-on Wrench Company  
A. G. Spaulding & Bros.  
Streloff-Naughton Corp.  
Texas Pacific Coal & Oil Co.  
Tidewater Oil Sales Co.  
U. S. Aircraft Co. of N. J.

U. S. Postoffice, N. Y. C.  
U. S. Rubber Company  
Women's Aviation Corner  
Wright Tuttle Aircraft Motors Corp.

### AIRCRAFT EXHIBITS—2nd FLOOR

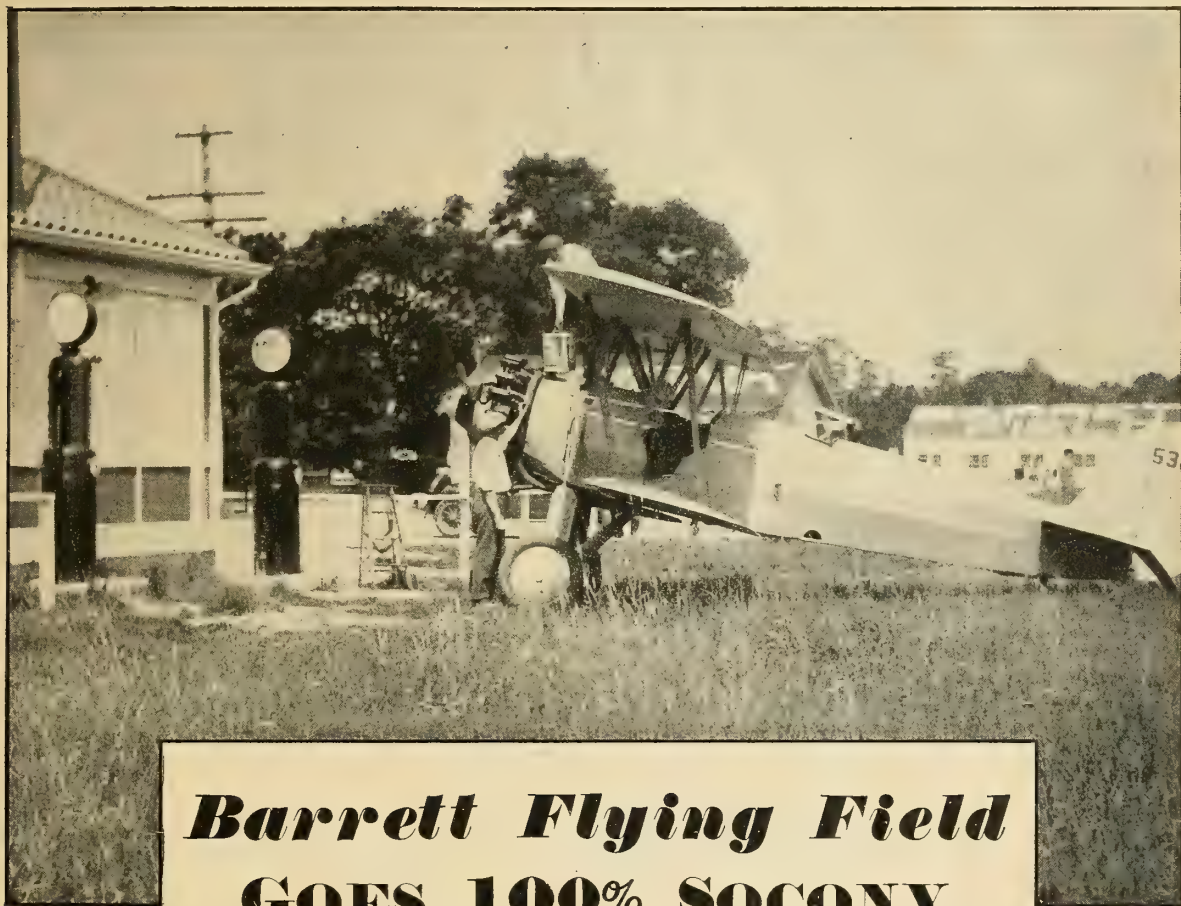
Aeromarine Klemm Corp.  
Arrow Aircraft & Motors Corp.  
Atlantic Air Service, Inc.  
New York Aircraft Distr. Co.  
Roosevelt Flying School  
Szekely Aircraft Corp.  
George A. Wies, Inc.

### OTHER EXHIBITS—2nd FLOOR

Airdrome Development Co.  
Airport Lighting Co., Inc.  
American Bleached Goods Co.  
Arch Roof Construction Co.  
Aviation Business Bureau, Inc.  
Aviation Souvenir Booth  
J. H. Bunnell & Company  
Casein Manufacturing Co.  
Cessna Aircraft Corp.  
I. Chertok Company  
Claude Neon Lights, Inc.  
Crouse Hinds Company  
Curren Machine Works  
Fyr Freez Company  
Guaranteed Aircraft Hangar, Inc.  
Hadley Corporation, Inc.  
Hardinge Sales Company  
Harley Davidson, N. Y. C. Dealer  
Metropolitan Indian Motorcycle Dealers Association  
Newark Air Service  
John Newmans Company  
Pyrene Manufacturing Co.  
Rockwell-Day  
Stark Tool Company  
Sturges Company  
Summerill Tubing Company  
Szekely Aircraft Corp.  
U. S. Plywood Company  
Valentine Varnish Co.  
Van Schaack Bros.  
J. Von Waldy  
Walker Cement Products, Inc.  
Edgar T. Wards & Sons Co.

### EXHIBITS—3rd FLOOR

Aero Digest  
Air Travel News  
Airports Magazine  
Airway Age Magazine  
American Aviator Magazine  
Amer. Museum of Natural History  
Associated Aviation Clubs, Inc.  
Autopulse Corporation  
Aviation Engineering Magazine  
Aviators' Post, American Legion  
E. W. Bliss Company  
Broadfield Airplane Co., Inc.  
Clersite Company  
W. F. Earls Associates  
Fairchild Aerial Survey  
Fairchild Publishing Co.  
Fleischman Transportation Co.  
Grant Airplane Model Co.  
Gimbel Bros.  
Grolier Society  
Harris Motors  
E. H. Holmes & Company  
Ideal Airplane & Supply Co., Inc.  
Irving Air Chute Co.  
Lycoming Motor Company  
Magazine of Business  
Metal Aircraft Corp.  
R. S. McKim Associates  
Miller Field National Guard  
Mt. Carmel Manufacturing Co.  
National Air Pilots Association  
National Sportsman Magazine  
Navy-Army  
Newark Airport  
Norman W. Henley Pub. Co.  
Oakite Products Corp.  
Out Door Life  
Pioneer Aero Trades School, Inc.  
Radio Corporation of America  
Sellel Manufacturing Co.  
Sunrise Flying Club, Inc.  
U. S. Department of Commerce  
U. S. Model Aircraft Corp.  
U. S. Postoffice Department  
Westerman & Company  
Worumbo Company



## ***Barrett Flying Field*** **GOES 100% SOCONY**

When flying in the Southwest, use the products of Magnolia Petroleum Company, and on the Pacific Coast standardize on the products of General Petroleum Corporation. These are two important subsidiaries of Standard Oil Company of New York.

**B**ARRETT AIRWAYS of Armonk, New York, use Socony products, and nothing but Socony products at the Barrett flying field. They have learned what many others have learned—you are *safe* if you book Socony Aviation Gasoline and Socony Aircraft Oil on every flight.

These products have behind them the reputation for quality and the incomparable service facilities of Standard Oil Company of New York. Little wonder, then, that Socony leads in the air, just as it has always been the overwhelming preference of the motoring public in New York and New England.

# **SOCONY**

REG. U.S. PAT. OFF.

## **AVIATION GASOLINE • AIRCRAFT OIL**

## **STANDARD OIL COMPANY OF NEW YORK**



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A N N O U N C E M E N T

The outstanding sport and training plane  
*of the world*

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rights in the United States with the  
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*Safest, easiest to fly, most dependable*  
**The AVIAN**  
*holds the following records:*

First solo flight, England to Australia  
 Fastest time, England to Australia  
 Longest flight ever made in a light aeroplane  
 Longest solo flight ever made  
 Fastest time, England to India  
 First non-stop flight, London to Rome



See the AVIAN at the New York  
 Aero Show, exhibited by  
 Air Associates, Inc.

National distribution of the Whittelsey AVIAN is planned.

Interested and responsible parties are invited to write for information concerning distributorship in zones throughout the country.

Air Associates, Inc., 535 Fifth Avenue, New York (hangar at Curtiss Field), have been appointed distributors for the New York zone.

**WHITTELSEY MANUFACTURING COMPANY**

*(formerly Whittelsey Body Company)*

**GENERAL OFFICES AND PLANT, BRIDGEPORT, CONN.**



# PERSONALITIES



by Caldwell

TO the six discriminating readers of this department I present a brief biography of Col. Arthur C. Goebel. And I do this with some of the pride that must have been experienced by the late P. T. Barnum when he presented to the curious of his day one of the famous exhibits that he was wont to refer to as: "The World's Only Living Specimen of This Unique Creature." For modest and retiring Art Goebel is, so far as I know, the only living specimen of a pilot who accomplished a sensational flight and didn't lecture about it. And that's an accomplishment in itself, as I know to my cost, for I've done my share of quiet suffering, listening to some of our famous pilots lecture. And I had put in my will a request, in case I passed out during the lecture, that my survivors should have cut on my tombstone: "He died listening; hell hath no terrors for him." What these famous pilots should do, if they want to lecture, is to tell the lecture to the Two Black Crows, and let *them* deliver it. The public, I suspect, also would prefer this plan.

However, perhaps some of the credit for Art's reticence should go to the rising town of Belan, New Mexico, where he was born on the 19th of October, 1895. Who could learn to talk in Belan, New Mexico? An audience of two discouraged mules and a Mexican Indian does not tend to make one garrulous. In fact, his early life left Art so silent that I never could get out of him just what happened to him from 1895 to 1920. If he stayed in Belan, nothing happened.

It may have been this early monotony that made Art show such amazing aptitude for getting himself into situations that held nothing of monotony in them. For during the Fall of 1920 and the Spring of 1921 he took flying instruction from Kenneth Montee, Jack Payzant, and Wally Timm of Los Angeles, and from that time on Art's life was about as tame as that of a lively herring pursued around a tank by six starving seals. In 1921 he went to Lima, Peru, —and he wouldn't tell me a word about what he did there. I couldn't even find out why he went on the Dole Flight—but then, I don't think he knew the answer to that one himself.

In the Spring of 1923 he bought several Jennies from the Army—and any flying those Jennies had done in the Army must have seemed like a vacation to them, once they had experienced what Art wanted them to do. He started off with plane-changing, just to get his muscles limber and wake himself from the awful lethargy induced by residence in Belan, New Mexico. Then he flew upside down for awhile to shake the sand out of his head, after which he proceeded to pick movie fellows and girls off roadsters, speed-boats, moving trains, and from under bridges. I knew a pilot who used to pick the movie girls from night clubs, but he did that with a Jordan Sport. Of course, this stuff got sort of

tame to Art after awhile, because he never had an accident, so he did his best to brighten up his tame existence by flying sideways between two trees—in a Jennie, mind you! It refused to crash, so he flew between the pillars and under the span of the Pasadena Bridge with two girls standing on the top wing and a camera on the tail of the Jennie, electrically operated by Art, so he could get a good movie of himself trying to commit suicide.

And now I've discovered for myself why he went on the Dole Flight—he needed the rest, that's all. That, by the way, was in 1927, August 16 and 17.

However, the next time Art crossed an ocean it was by boat to Japan, over which he toured in a Fairchild on floats for 46 days, and was entertained by the Navy and Army officers, who presented him with a historic Japanese helmet, that country's mark of recognition for heroic work. About the only thing they didn't give him over there was the Safety First Society's leather medal for crossing crossings cautiously—they're saving that for Dick Depew or me, I don't know which.

Once Art really got into his stride he started to do some flying. He flew twice over Pikes Peak in an Eaglerock, August 2 and 3. He flew from Los Angeles to New York, non-stop, in 18 hours and 58

minutes—on August 19 and 20, 1928, with the late Harry Tucker as passenger.

On the return flight to the races they landed at Prescott, Arizona, out of fuel. On September 21 Art flew non-stop from Los Angeles to Cincinnati, just to get in practice for a really long flight. I venture the guess that he intends eventually to fly around the world. He is just the sort of man who would want to do that. And he seems to have the sort of luck, added to experience and ability, that would get him around. In fact, he's been so lucky in the past that I feel there's no limit to it.

Why, he might even roll the bones with George Haldeman—and win. But I don't know—when a pilot can fly to the middle of the Atlantic, lose his oil, and then have a steamer on the exact spot to pick him up, how can anyone in the world expect to beat him shooting crap?



POOR old Russ Brinkley, the Flying Joker of Latrobe, Pennsylvania, spent the winter buried down under the snow of those parts, and was all set to hop off with the first thaw when—along came a big fire that cost the town about a quarter of a million dollars. Russ lost the plane he was building, and two motors, which so unsettled him that, he says, "I took a fool notion at the field last Sunday to do a little wing-walking to break the monotony, and wore out nearly an hour's time crawling around on a Canuck piloted by Ray Elder. It never was my ambition to make a living at wing-walking; but a fellow has to have some fun, especially after he's been cooped up for the winter."

That just goes to show the danger of a pilot's spending a winter in Latrobe, Pa. Especially if he's been "cooped up." He might survive all right, it would seem, if he had been allowed to run around loose. But putting him in the coop did for him and drove him eventually to crawling around on a Canuck, apparently on his hands and knees.

I don't know why it is, but you take these country boys away from behind a horse and seat them behind an OX5, and they just seem to go mad. There's Carl Gault Strickler, of the same fair town, for example. He is marrying a school teacher. That's what 1,400 hours in the air did to him—drove him to matrimony. If he had stuck with old Dobbin he'd be a single man today. He might have got his lines tangled occasionally, of course. But you can untwist *them* easier than you can marriage lines. "Strick still eats peas with his knife," says Russ. Maybe. But she'll soon snap him out of that; and also: "The old boy hauled about 2,000 passengers on the paid list in 1927 and Heaven knows how many blondes," says Russ. In the sad year of 1929, I prophesy, they'll *all* be on the paid list—and not a blonde in the lot.

(Continued on next page)



Colonel Arthur C. Goebel



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(Person, Airlines continued)

**J**DON ALEXANDER, the man with a smile from Colorado Springs, tells me that James L. Mayberry, president of the Golden State Aircraft Co., placed an order for fifty Eaglerocks for northern California. In March, 1927, Mayberry purchased the California Eaglerock franchise, and in less than a year he had sold over 100, which makes him just about the star airplane salesman of the world. If anyone has sold any more in the same length of time, let's hear from



Jas. L. Mayberry

him. Of course, he has an advantage selling airplanes in that territory, especially if the purchaser does much flying over the Rockies. According to Dick Allen, of the Shaw Publications, who came back that way in a Stinson-Detroiter, each gentleman presenting himself with a forced landing in that section has to turn right around and present himself with a new airplane, if he wants to do any more flying—that is, he picks the pine needles out of his hide, and then he gets his next airplane. And Dick said that when you're flying through the forests it's no use figuring that you could land on the railroad track, because half the time the railroad track is running through snowsheds—and the other half of the time it's going through tunnels. Seems like the only way you could even follow the railroad would be to look at the tracks through an X-ray machine. So you can just figure out for yourself how Mayberry came to sell those hundred Eaglerocks and will sell at least fifty more; and also you can figure out why the wily J. Don Alexander joined the Save the Forests Movement. What he wants are more forests and more mountains.

But this lad, Mayberry, pulled a hot one and sent it out as a news release to boost business. He had Martin Jensen, Survivor No. 2 on the Dole Catastrophe, teach a university student to fly with five hours' and forty minutes' dual. The student was Bert O'Niel, University of California athlete and evidently of Irish descent. And it's no trick at all, to teach an Irishman anything in five hours. There's just two kinds of Irishmen, you know—the kind who can learn anything in five hours, and the other and more usual kind, who couldn't learn anything in five years. The first lot are from the North of Ireland, and the second batch are from the South. My ancestor, the Reverend John Cassidy—and may his soul rest in peace!—came from the North, and he gave me those figures himself, so they must be right, as you'll agree, unless your own ancestors came from the South. And if they did, your opinion is obviously of no value, except to yourself.

As to the O'Niel boy, I can't quite figure whether he came from the North or the South, for he learned all right, and then, according to the news release: "The only

mar to the success of his first solo was a broken wheel and propeller tip due to a sudden gust of wind that ballooned the plane while O'Niel was about to make his solo landing. This stalled the plane and it dropped the few remaining feet to the ground, doubling the wheel under and causing the plane to nose forward until the propeller touched." Outside of that, the solo was perfect. As I've always maintained, flying is perfectly safe—it's when the plane stops flying and hits the ground that the damage is done. I've said that time and again, and I repeat it—it's the last inch that helps the undertaker.

But how times have changed when the fact that a lad almost learns to fly in five



Bert O'Niel

hours is news. During the war, up to 1916, if a pupil didn't go solo in three hours, or four at most, the patient instructor would say to him: "Are you ever going to learn this blank blank business, or are you going to die of old age on my blank blank hands?" (Exact words deleted to protect my nephew,

Alan Goodspeed, who reads this. I must keep the lad innocent as long as possible, though I know it really can't be done. Boys will be boys.)

**T**HAT scientific investigator of the atmosphere, Professor Jack Laass, gives the results of his test of a new type of propeller which had a guarantee a yard long and a foot thick: "At 400 feet we, my mechanic Bill and myself and sand bag of 150 lbs., heard the most frightful pounding I have ever heard outside of you pounding the typewriter. Of course, I instantly turned off the gas and switch as the motor swung right out of the plane and to the left and down without the faintest attempt at r.p.m.-ing. When a motor stops with me its result is like blowing the six o'clock whistle. I call it a day and return, if possible, to the hangar. Only in this case I would have to land down wind, so I decided to drop in on P. A. Transport Field.

"The motor having changed its position made it a bit awkward for me to hold the nose up, so I suggested to Bill if he wanted to have supper at home to-night instead of being fed it with a spoon by a woman in a white uniform he had better get as far back in the cabin as possible. As that deadly calm prevailed, like it does when all motors quit, I heard Bill making a good job of getting to the REAR with all speed. This helped some, but still we were in a steep dive, which was only stopped by diving it more to pick up speed, to be used in levelling off near the ground, and when necessary on the way down. In a few seconds I levelled off on the field, holding the stick all the way back like a student on his first solo.

"Just could not get the tail down, so we hit about 80 miles per hour down wind. When we touched the ground, the motor, which was hanging by the oil lines, gas lines, and cowlings, just rolled right out of the ship, going back between the wheels and landing gear struts, to have the belly of the ship hit the thing a jolt that made us think all earthquakes had struck at once. Being free of the motor, we shot up into the air again. At a speed of 80 we coasted along, with me holding to the stick yet, but this time trying to get it farther forward. The sand in the rear, with Bill's weight, minus the weight of the motor up front, sort of reversed the first condition, you might say.

"We did like you would do—hung on and emitted a short prayer in case the Grim Reaper had his cutlass out and sharpened up; but at length—it seemed ages—we settled to earth in a somewhat normal position, but ground-looping to the left because the left rudder wires had been cut as the motor went under the ship. In addition, parts of the motor had lammed Bill in passing, as he sat on the floor. At last we stopped, got out, and looked around to find the California sun still shining bright, clouds lazily moving overhead, and an occasional airplane taking off. We thought, 'Isn't the world a good place to LIVE in!' Bill said it was the best world he had ever been in, and I agreed. We found later the blade of the prop, which told the story of rotten workmanship, poor gluing, and still (if possible) rottener wood."

(The interested reader may learn the name of this excellent acrobatic propeller by writing Professor Laass, who will be very glad to recommend it to anyone contemplating suicide.)

**R**OY DODSON of Kirksville, Missouri, tells me that Eaglerocks are going good in his territory of Southern Iowa. Roy has a school at Kirksville, 13 pupils, and no superstitions, apparently. I'll be in Missouri one of these days and will call on Roy if I can find a large scale map that shows Kirksville.

I wonder how Roy finds the burg himself. Suppose he loses track of it and has to land and ask his way. "Which direction is Kirksville," he asks hopefully. "Which?" in-



Roy Dodson

quires the helpful native. "Kirksville," says Roy, "Kirksville, Missouri, Mo." "Never heard of it," says the stranger. "You're sure there is such a place?" "Sure!" exclaims Roy, indignantly. "Why, I live there, mister." "Then perhaps you know where it is," says the man, walking away. "I'm sure I don't." That's one advantage of living in New York—everybody knows where it is. That's the only advantage.

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Editor

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# AIRPORT AND AIRWAY

*News of airlines, airports, and airways; radio, lighting and other auxiliary services*

## Aircraft Communications Must Determine Their Radio Requirements

HON. O. H. CALDWELL, member of the Federal Radio Commission for the first zone, has addressed the National Advisory Committee for Aeronautics, requesting that civil aviation groups present a coordinated idea as to the future radio channel requirements for aircraft radio communications. "The Federal Radio Commission is highly desirous of obtaining a well balanced plan of nationwide operation of radio communications in the service of aviation. In this plan, the approximate number of radio channels required for aviation communication should be outlined. In any event, it seems highly important that the various civil aviation groups be brought together so that they may agree on a comprehensive radio plan which can be presented to the Federal Radio Commission as representing the views of aviation."

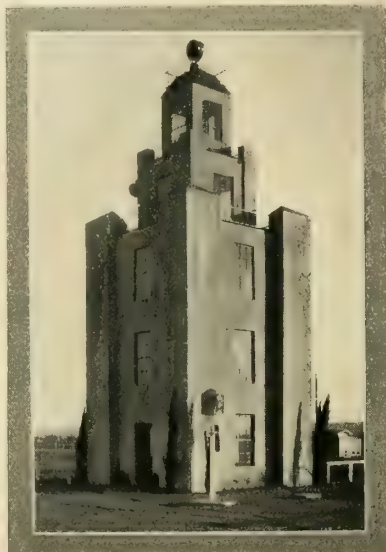
The Commissioner's request is difficult to comply with inasmuch as the future needs of aviation cannot be accurately estimated at this time. Aircraft radio navigation and communications are, from the standpoint of practical commercial service, almost unutilized, and therefore what may be an adequate number of channels today may be far short of the needs of tomorrow. A sufficient number of channels is necessary to permit the installation of airway direction beacons without the possibility of confusing beacons serving adjacent routes. Since we do not have the slightest knowledge of how many aircraft routes will eventually be established and to what extent beacon signals will be used for navigating them, the number of channels which will be required for the purpose can only be guessed. Shortwave marker beacons will not, presumably, require a great number of channels and the frequencies selected for their use must be of an order which assures a limited range without skip distance or repeating effects. The most difficult requirement to ascertain is the needs of plane to ground and inter-airport communication.

Airway radio is in exactly the same position that marine radio communication was in 1910, when the radio telegraph first began to be extensively used. All ship and shore stations then operated on a frequency of 500 kilocycles (600 metres), each standing by for the other, according to which first established a communication. The amount of traffic handled per ship was very limited and consequently one wave length sufficed for all normal needs. Had anyone been asked to state the future assignments required for future marine communications, the utmost optimism could not have suggested a larger number than ten or twenty channels. Today certain liners may transmit as many as 2,000 messages per trip, and ship-to-shore radio telegraph traffic is exceedingly heavy. Scores of frequencies are used, and 500 kilo-

By  
Edgar H. Felix

cycles is employed only for calling purposes.

However, this is no answer to Commissioner Caldwell's request; it is a warning that air travel interests must busy themselves with the problem. The Federal Radio Commission is now faced with the problem of allocating high frequencies. It is under pres-



The five-story administration building at the Los Angeles Metropolitan Airport

sure from numerous corporations seeking to employ the all-too-few available channels.

If aircraft communication is not later to be seriously hampered, it is highly necessary that some attempt be made to predict adequately its future needs. Only with the support of a thorough understanding of the characteristics of high frequency communication and with the problems now facing the Federal Radio Commission in high frequency allocation can satisfactory recommendations be worked out. This is a matter calling for the cooperation of everyone having knowledge of the possibilities of aircraft radio communication and particularly those who have had practical experience in the actual use of aircraft communication.

## Need for Uniform Airport and Airway Regulation

A SPECIAL Joint Aviation Committee of the New York State Legislature is preparing a report to that body for the formulation of aviation regulation. It has wisely consulted the Assistant Secretaries for Aeronautics of the War, Navy and Commerce Departments, in order that the proposed legislation shall be in accord with national policies. Other states are also considering legis-

lation affecting aeronautics. Governor Moore of New Jersey, for example, recently returned a bill to the State Legislature without his signature, intended to permit leasing of municipal park lands for airport purposes. Other instances might be cited showing not only state, but even municipal regulation, applying to airports and air travel, is being promulgated, establishing legal trends, with but little guidance from those who will be most affected by them.

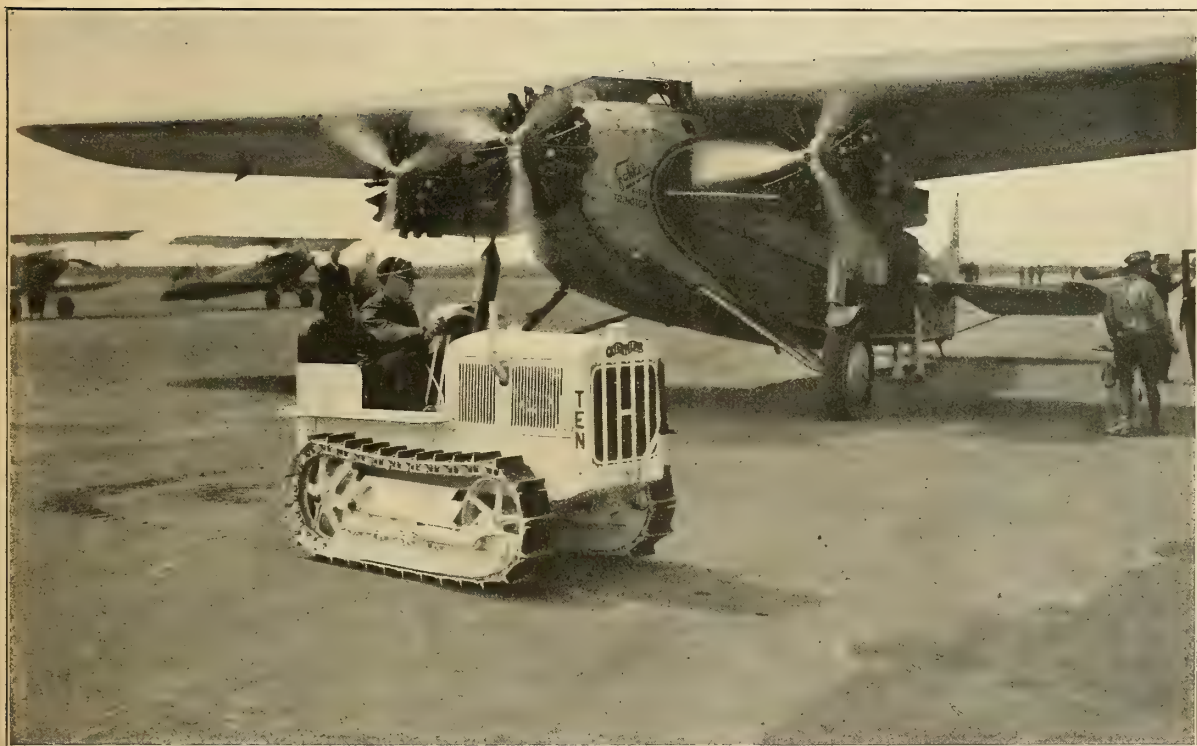
The danger exists that laws may be passed which will confuse aircraft travel. Regulations applying to airport management and ownership naturally fall to the states, and, consequently, protection against unwise regulation does not lie in placing entire dependence upon our very intelligent and skillful Federal regulation. In built-up areas, where airports are most necessary and most difficult to lay out in an ideal manner, the possession of real estate suited to the purpose may require the power of public condemnation in order to make it available to the community. The aircraft landing field in private management must be conducted in a manner favorable to the growth of air travel in general. Any tendency toward selfish restriction must be curbed by legislation before vested rights are too firmly established in this quasi-public function. While congestion is not yet a serious problem, we do not readily conceive of the possibility that a private management may work in a manner detrimental to air travel as a whole. When problems do arise, the only recourse will be state or local legislation. Let us determine that such regulation shall be consistently wise by encouraging uniform state and municipal laws.

With a view to securing such uniformity and the preparation of the most practical legislation, aircraft associations may well apply themselves to the formulation of a uniform state aviation law and a uniform municipal aviation ordinance. The electrical industry, faced with confusing regulation by thousands of municipalities, all requiring materials of different standards and of different factors of safety, drew up a National Electrical Code, which has been widely accepted as the best possible ordinance in hundreds of cities throughout the United States. The result is that expertly prepared regulations by municipalities applying to electrical installations are the rule, and manufacturers rarely find their products excluded from one city or another because of the adoption of an unwise regulation recommended by a city engineer, whose views may be founded upon a single and unusual case of electrical fire or safety hazard.

The National Electrical Code is prepared by a body which is maintained by appropriations from the various trade associations, representing the several branches of the electrical industry.

*(Continued on next page)*

# The Airminded "Caterpillar" Tractor



Landing fields to be kept smooth, planes to be pulled from hangars, snow to be pushed aside,—all sorts of jobs to be done from heaving a big tri-motor out of the mud to doubling for a disabled stationary engine. ((The "Caterpillar" track-type tractor is airminded. Agile, sure-footed, powerful ground-gripper that it is, the "Caterpillar" has become an indispensable friend to the flyer at a score of airports. Here is the new Model Ten helping a tri-motored Fokker out into the open. ((There is a "Caterpillar" dealer within reach of your phone. Ask him how "Caterpillars" help to keep the upkeep of airports down.

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# TRACTOR



(Continued from  
preceding page)

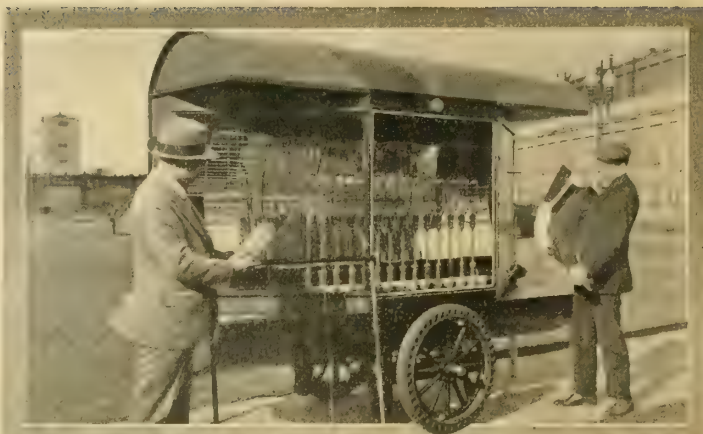
The aircraft industry should emulate this successful example and proceed promptly to study sane and constructive legislation for states and municipalities.

#### An Experiment in Airport Financial Administration

THE organization of the Los Angeles Metropolitan Airport, of which Waldo D. Waterman is general manager, points the way to a practical form of management which may be applicable in many cities. The company has purchased 381 acres of land, facing 4,000 feet of railroad trackage, adjacent to two concrete highways, and within one half mile of an interurban line. The soil and topography is such that practically no grading or drainage is necessary.

The field was first laid out to meet what was considered the eventual requirements for runway and landing area for a project of the size contemplated, together with adequate street and landing area approach system. This consists of two runways at approximately right angles to each other, each 4,000 feet long and 1,000 feet wide, with numerous taxiing approaches 200 feet wide and several automotive streets, 50 feet wide. The field comprises approximately 240 acres and the balance of 140 acres is divided in sites, ranging from three and a half acres down to small plots for hangars. These building sites may be purchased for cash or on time, or leased with an option to purchase. The operating company owns, controls and maintains the areas used for landing as well as lighting system, administrative and maintenance departments. The landing area will be surfaced, sodded and drained where necessary; a lighting system, including floodlights, beacons, approach, border and obstruction lights, illuminated wind indicator and ceiling lights are being installed. Provision is made for a meteorological station and radio transmitter which is to be installed shortly.

When the last building site is sold and the last share of stock in the operating company disposed of, the stock will be prorated among the various site holders in proportion to the estimated value of their sites. Thus a complete operating airport will be turned over to the purchasers of the land, together with a complete owner-management with full rights to select their managers, dictate policies and collect all revenues, and in other ways control the functioning of the airport. It is anticipated that sufficient revenue will be derived from landing fees paid by transients and various other sources of revenue to maintain the improvements and lighting system after they have once been installed and turned over to the operating corporation. The stock



Novalux airport lighting projector, showing section of mirror and lamp

will be assessable but so widely held that assessments are not likely to prove burdensome. As an example, the owner of a site 75 by 150, sufficient to accommodate an eight-ship hangar, costing \$2,850, would be assessed only \$22 to meet a \$10,000 deficit. Adequate restrictions are provided in the deeds to secure uniformity of building and proper precautions against fire hazard.

Foresight is being used in grouping the sites. The larger manufacturers will locate along the north border of the field, adjacent to the railroad tracks; the air passenger depot and the administration building will be grouped in the corner of the intersection of the flying area, as close to the center as possible, with airport transportation company offices nearby. Beyond this, to the south, will be the air service operators, dealers and distributors, while the balance of the plots to be sold are for private hangars.

#### A New Airport Floodlight

A NEW type of airport floodlight which dispenses with the conventional circular lenses and mirror has been developed by the General Electric Company. The light, which was designed by C. A. B. Halvorson, designing engineer of the lighting department of the company at Lynn, Mass., uses fourteen high-power incandescent lamps, giving a total of approximately three million beam candlepower. The lamps are arranged in a row in front of half a dozen cylindrical mirrors that spread the light over the field without permitting it to rise high enough to interfere with the vision of pilots landing directly into the beam.

Each incandescent lamp uses 1,500 watts, making a total for the new unit of 21 kilowatts. The tubes are gas-filled with tubular bulbs to care for heat radiation. Six mirrors of special optical glass are accurately ground so as to be parabolic in the vertical direction and plane in the horizontal. Each mirror is 36 inches high and 15 inches wide. The floodlight gives a spread of approximately 160 degrees horizontally and only two or three degrees vertically. The whole unit is mounted on a portable structure.

At a distance of a mile from the floodlight, there is sufficient illumination so that a newspaper can be read; at 2,500 feet, a pilot can quickly and accurately determine the nature of the landing surface.

#### Hangar Construction

THE Los Angeles Metropolitan Airport has displayed one of those rare cases of good airport architecture in the design of its Administration Building. The majority of airport construction resembles that of the mining town of the gold rush period. It is a little early to consider the beautification of airports when changing conditions may make necessary rebuilding of hangars and runways and utility and flexibility are still the leading considerations. Numerous unit hangars have been designed by the various makers of standardized buildings. There is much to be said in favor of the small knockdown hangar of the all-metal type which can be readily disassembled and re-erected on a new site. The larger airports are being expertly laid out, but many a smaller community, handicapped by lack of funds, and many a private field is the better for having erected hangars of a temporary yet serviceable nature so that, as requirements become better known and enlargements of the field become necessary, a regrouping of the buildings may be effected without substantial waste of material.

The Virginia Bridge & Iron Company has submitted data on a T-shaped hangar of all metal design with steel frame, metal covering and steel sash, which can be built

(Continued on next page)



When open, the doors of this Ideco hangar are folded so that no windows are obstructed or interior light cut down

# IDECO STANDARD BUILDINGS



**T**O see an IDECO building is to have a new appreciation of how good a standardized steel building can be.

IDECO steel buildings are insulated against heat and cold, galvanized against rust and corrosion, sealed by lock-joint sheeting against rain and snow, are fire-safe, easy to erect or alter, adapted to your particular building requirements and are most economical in price.

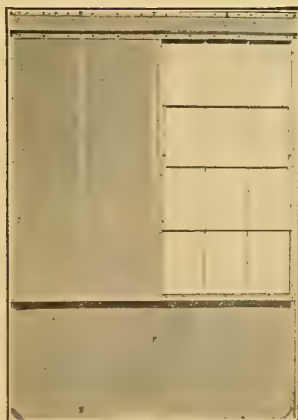
Their attractive appearance, the quality of engineering, material and workmanship will instantly appeal to you. Only by carefully checking the many features of these buildings can you judge the value offered in these structures.

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*A typical  
IDECO  
Insulated Plant*



**I**LLUSTRATED here is a typical IDECO insulated panel. The insulating material held firmly against the sheeting produces an insulating value equal to a 13" brick wall, or 20" of concrete. As no wooden nailing strips are used, there is no increase in the fire hazard.

At a cost of approximately one-half of a brick or masonry type building, the same protection against heat or cold is obtained, yet the many advantages of the sectional construction are retained.

Branches:—Detroit, Dallas, Houston, Shreveport, Tulsa, Torrance, Los Angeles

Export Representation: 74 Trinity Place, New York City; Columbus, Ohio; Houston, Texas; Los Angeles, Calif.



(Continued from preceding page)

at moderate cost and has the advantage of entirely modern, permanent and fireproof construction.

Unusual flexibility of construction is secured by standard unit hangars, such as those made by the International Derrick and Equipment Company of Columbus. These hangars are covered with Ideco sheathing, made by forming Armco Ingot Iron into galvanized sheets. This material is sufficiently rust proof to make painting almost unnecessary. The illustration shows how the roller hung doors fold neatly in a nest so that no windows are obstructed in a manner to cut down interior light.

The George T. Kocher Lumber Company of Lima, Ohio, is marketing knockdown airplane hangars with prices ranging from \$325 to \$1,080. The materials furnished include framing lumber, siding, roofing, sash, door and sash hardware, nails, paint and oil in sufficient quantities, also instructions and drawings for erection. The Guaranteed Aircraft Hangar Co., on the other hand, not only furnishes all material, including steel work, but erects the building on the selected site.

#### Solving the Drainage Problem

THE municipal airport at Buffalo is one of the best examples of scientific solution of the landing field drainage problem. An extensive drainage system of Armco perforated iron pipe has been installed, having a total length in excess of a mile in diameters ranging from 20 to 30 inches. Although the field at Buffalo is high enough above its surroundings to make the ultimate removal of water from the field a simple matter, several factors enter to make surface drainage difficult.

The first of these is the slope of the

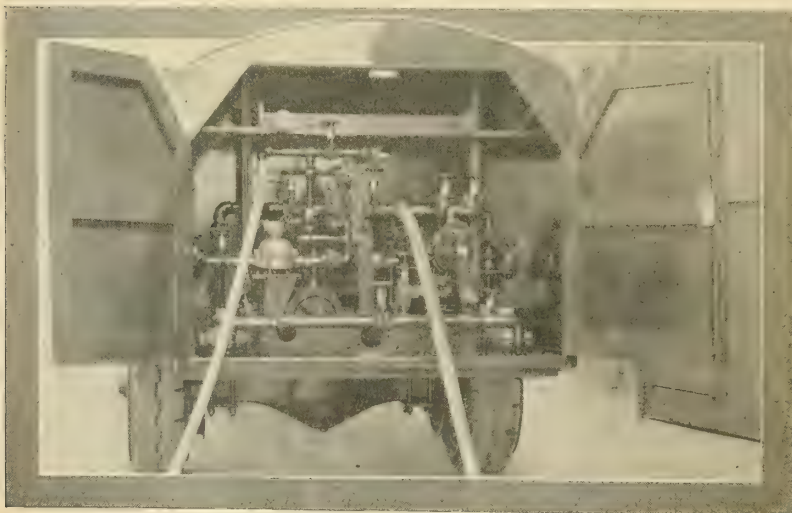
runway and then standing for some time on the main part of the field until it seeped away.

Obviously, rapid collection of water as well as rapid removal is essential. The Armco pipe is perforated throughout its entire length and covered with pervious material. The perforated iron pipe accomplishes immediate removal of water from the field. The system operates even under abnormal conditions and the runway has been found in the best of condition for flying even after four days of almost continuous pouring rain. Installation of the pipe is easy and rapid, and it is very durable. It possesses considerable inherent strength and can support heavy traffic without additional reinforcement.

The Armco Culvert Manufacturers' Association has prepared comprehensive data on corrugated pipe drainage installations. From this data, the effectiveness of subterranean drainage systems of this type can be readily calculated.

THE Heil Company of Milwaukee, Wisconsin, has issued a bulletin describing its line of aircraft refueling tanks mounted on motor trucks, with capacities of 1,000 and 1,200 gallons, equipped with a rotary pump, feeding fuel through a two-inch flexible hose into the tank of the plane. Means are provided to heat oil in winter so that it can be pumped under all conditions. The tanks are divided into sections from which fuel can be drawn at will.

THE Alith-Prouty Company of Danville, Ill., has developed special airport door hardware which is well designed to meet the requirements of modern hangar construction. It has issued a comprehensive catalogue of its very complete line.



The pumping equipment of the Heil aircraft refueling tank

ground. South and west of the runway, the slope is very gentle, merely enough, in fact, to provide a natural slope. Above the runway, it is considerably greater. The effect of this sloping was to cause the water to pour down from surrounding areas, eroding the

**The Gibbons Landing Platform**  
R. JAMES GIBBONS of the Advisory Board of the Guggenheim School of Aeronautics of New York University has completed a model of a new airplane landing and launching device which has been the

subject of wind tunnel tests and extensive research. The device is to be installed on roof tops in congested districts. It consists of a platform, 210 feet long and 60 feet wide, on a swivel base, 40 feet in diameter. It has the appearance and is similar in mechanical action to a revolving gun carriage. The Gibbons platform allows the pilot full advantage of the prevailing wind, turning into it automatically with the aid of an electrically operated wind vane. The platform can also be maneuvered transversely so that it becomes an inclined plane, banking at an angle up to 25 degrees. For a take-off, the platform is tilted by an operator, seated in a cabin at one end of the platform. The machine is poised at the top of the incline, held by a new type of anchor which the pilot releases by a cockpit control. When he has maximum propeller thrust, and the motors are warm, he lets go the platform and roars down, aided by the force of gravity. For a landing, upon receipt of a suitable signal from the platform operator, the approaching plane makes a landing at the lower end of the platform. The moment the landing wheels and the tail skid touch down on the landing surface, they meet a series of spring cable retarders so designed that they operate as an arresting force but constitute no tipping hazard. The device is equipped with a reversible fan system, used either to blow away the snow in winter or as a source of suction to keep the plane from bounding away after it hits the runway. A heater keeps the platform free of ice and a lighting system gives soft luminescence without hampering visibility or vision. The rim of the platform is outlined with neon lights. The usual rotating signal beacon and illuminated wind cone complete the equipment.

THE Navy Hydrographic Office has issued its first pilot chart of the upper air for the North Pacific Ocean. It sets forth flying conditions, based upon data submitted by seven hydrographic coastal stations on the Pacific Coast and the stations at Manila, Guam and Honolulu. It is the first of a series of charts which will be issued monthly hereafter. Wind diagrams for altitudes of 10,000, 5,000, 2,500 feet and sea level for areas in the vicinity of the stations are given.

#### Cutting the Cost of Geodetic Surveys

THE successful completion of the first quadrangle of authentic airplane maps in northern Wisconsin was completed by J. G. Staack of the United States Geological Survey. The quadrangle covers the Three Lakes district, including parts of Vilas, Forest and Oneida counties. Striking differences between the old Government survey maps of the Three Lakes region and these new base maps were uncovered. Many unmapped lakes are shown, while the early topographers' markings of lake shore lines have been proved to be almost entirely inaccurate.

The airplane cameras are remarkable in their ability to register the smallest details,  
(Continued on next page)



## LIGHTS *that fill the skies* *with commerce*

By July 1, 1929, more than 11,000 miles of established airways in the United States will be lighted for night traffic. The Department of Commerce is thus carrying out a definite program which includes a rotating beacon every ten miles and a lighted intermediate field every thirty.



The illuminating engineering laboratory of the General Electric Company is prepared to submit a complete lighting plan for your airport and its buildings. This is without obligation on your part. Address the nearest G-E sales office or write directly to Schenectady, N. Y.

To insure their participation in this development of the world's fastest transportation system, American cities are building—and *lighting*—airports. The white spots on the map indicate the approximate location of airports already lighted by General Electric equipment. In addition, over 600 electric beacons have been supplied by this Company for airport and airway service.

# GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

711-26



(Continued from preceding page)

picturizing the beds of old rivers, various zones of present lake shores, drainage ditches, pipe-lines and even differences in fields under cultivation. It is estimated that the cost of aerial mapping amounts to less than two cents per acre and, since the Federal Government pays half the net cost of survey to the State, the actual outlay by the State would amount to less than one cent per acre for this accurate and high speed method of mapping.

#### Concrete vs. Asphalt Runways

THE Ford airport is a fine example of the liberal use of concrete in the runway. At Mills Field, San Francisco, the concrete apron is 100 feet wide and 530 feet long. New concrete has excellent visibility although, with time, its appearance may become marred by oil tracks and other discolorations.

Asphalt paving for runway surfaces also has its ardent supporters. It possesses greater resiliency and is more quickly and less expensively applied. It is better suited to conspicuous marking, orange lettering on black having superior visibility. It also affords better traction for braking purposes and is easily and quickly repaired. Although airport runways must bear heavy loads, they are not subject to the tractive effort exerted upon highways. They merely roll an idle load, the traction being applied to the air through the propeller rather than to the wheels of the plane. The debate of concrete versus asphalt for runways is likely to be protracted, with good arguments on both sides.

#### The Loening Amphibian Landing Place

THE Loening Aeronautical Corporation, now a unit of the Keystone Aircraft Corporation, has a well equipped and efficient amphibian landing base near its factory at 31st Street and the East River in New York City. It consists of a freight

car float several hundred feet long and sixty or more feet wide. It is equipped with bulkheads for water ballast, by which the end extending into the river has been sunk several feet below the surface. By using the ramp, pilots can land on the river, letting the wheels of their planes down in the water and steering for the ramp. As the water grows shallow, the wheels strike the artificial shore and are then taxied up the slope where passengers may be discharged without the necessity of wading or transferring to boats. Since the ramp is a float, it may be used at all tides.

#### Motor Upkeep Costs

THE Wright Aeronautical Corporation has compiled data on the cost of operation of 91 Wright Whirlwinds, used on nine of the leading airlines. While the data is not complete in some items, the figures give a fair average of the cost of Whirlwind operation.

Total hours operation (91 engines).....	34,464
Average hours operation (91 engines).....	491
Average R. P. M. (62 engines).....	1600 to 1650
Mean fuel consumption (74 engines).....	13.6 gal. per hr.
Mean oil consumption (74 engines).....	.51 gals. per hr.
Time to first overhaul (91 engines).....	290 hrs.
Time to second overhaul (68 engines).....	285 hrs.
Man hours for major overhaul (59 engines).....	74.5
Cost of parts per operating hours (37 engines).....	\$1.05

The cost of replacement parts is compiled for 37 engines because only that number required them. Nearly three and a half million miles at an average of 100 miles an hour were flown by the planes. Assuming labor costs of \$1.00 per man hour for overhauls, maintenance cost is about \$1.30 per flying hour or \$0.013 per mile. Depreciation based on 2,000 hours' engine life and an average initial cost of \$5,000 is \$2.50 per hour or \$0.025 per mile. Fuel costs, based on an average price of \$0.18 and \$0.75 per gallon for gasoline and oil respectively, amount to about \$2.82 per hour, or \$0.028 per mile. The total cost of engine operation is \$6.62 an hour, or \$0.066 per mile. This is, of course, engine cost alone and does not include piloting and plane repairs or maintenance.

#### Reports of Airlines and Services

ONLY two forced landings in 200,000 miles of flying over a period of three months since the Boeing planes were put on the line, is the record of Pacific Air Transport's Seattle to Los Angeles air mail and passenger route, according to the general manager of the company.

AT an average speed of 99.7 miles per hour, Boeing Air Transport's San Francisco and Oakland-Chicago air mail, express and passenger route flew, during October, 177,742 miles, 66,576 miles of which were covered in darkness.

Air mail loads totaled 124,191 pounds, and 151 passengers were carried over 81,672 passenger miles. The line's twenty-four biplanes were in the air 1,771 hours and 47 minutes, flown by twenty-eight pilots. Total miles flown from July 1, 1927, to November 1, 1928, is 2,240,167; total mail carried, 1,005,314 pounds; total time in the air, 22,477 hours 29 minutes.

Only 4½% of delays were caused by mechanical difficulties. There were but three minor mishaps, none resulting in injury or loss of mail. This report includes the Chicago-Lincoln day service, operated by Boeing, 483 miles in length, which, with the transcontinental route west from Chicago (1,943 miles), totals 2,426 miles, flown twice daily.

IN its first year of operation, the Key West-Havana service carried over 18,000,000 letters and 1,200 passengers.

#### NORTHERN AERIAL MINERALS

EXPLORATION, a Canadian company, has completed its first season's operations with four good discoveries, a gold mine at Crow Lake in western Ontario, a copper-lead-silver mine in the Athabaska Lake region and a copper and gold mine in regions not disclosed. The company's prospecting planes flew more than 100,000 miles during the season, and 100 men were maintained in the field.

THE Federal Radio Commission has allocated high frequency waves to the Boeing Air Transport Company, Inc., and the Western Air Express Company, both of Seattle, Wash., for communication with planes in flight.

A SYNTHETIC material for making the gas cells used in dirigibles, developed by the Bureau of Standards as a substitute for goldbeater's skin, will save half a million dollars each on the two 6,000,000 cubic foot airships authorized by Congress. The importance of this discovery is indicated by the fact that half a million goldbeater's skins, obtained from the inner lining of one of the intestines of the ox, were required to build the Shenandoah, which had to be selected from 1,500,000 ox intestines. Since the annual slaughter of cattle in the United States is but 10,000,000, the development of this substitute eliminates an important limitation to making numerous large airships.



A Caterpillar tractor hauling a Boeing transport out of its hangar



# BUTLER

## READY-MADE HANGARS



In Butler Ready Made Industrial buildings the structural purlins are a combination of tubular and I-beam design giving the maximum strength attainable per pound of steel.

In all Butler Ready Made buildings, the galvanized steel wall and roof sections are stiffened with deeply drawn corrugations on 8-inch centers giving a neat paneled effect.

EVERY engineer knows the innate strength of tubular steel and of I-beam steel. The strength of both is inwrought in vital structural members of Butler Ready Made Hangars and Industrial Buildings. Witness the cross section view (to the left) of a purlin from the structural frame.

Throughout Butler Buildings, the natural strength of steel is multiplied by ingenious shaping. Even the galvanized steel sections of walls and roof are given great rigidity by deeply drawn corrugations (cross section view also at the left) on 8 inch centers.

An essential in Hangar construction is wide, clear spans. The span of the Fairfax Field Hangar at Kansas City, shown above, is 80 feet. Its length is 150 feet. Butler Hangars are not confined to airport sizes. Above is also pictured an individual type affording safe quarters for the privately owned plane.

The completeness, the economy of acquiring and of upkeep, the fire resistance, the speed in erection of Butler Ready Made Hangars and Industrial Buildings is plainly apparent from a reading of our catalog "C," but you will be most impressed by their permanent character and their flexibility which permits enlarging or taking down unit by unit without the loss of anything more than a few dropped bolts.

Let us send you catalog "C."

**Butler Manufacturing Company**  
Eastern Ave. at 13th KANSAS CITY, MO.



#### Models in Production

Three Place open. Four Place cabin.

#### Power Units

Designed for installation of J-5 AB Wright Whirlwind, 200 H.P. motor. Other power units may be installed.

#### Loading

Normal pay load, two passengers and baggage, 400 to 500 lbs. Gross wt. 2650 lbs. Power loading (J-5 AB) 13.25 lbs. per H.P. Wing loading 8.06 lbs. per sq. ft.

#### Dimensions

Wing span—upper 34', lower 30'. Total wing area 310 sq. ft. Overall length 24' 6". Maximum height 10'. Wheel tread 7' 6".

#### Performance Data

(Conservative with full load.) Maximum speed 130 M.P.H. Landing speed 42 M.P.H. Rate of climb at sea level 1400 ft. per min. Service ceiling 14,000 ft. Cruising speed 1600 R.P.M. 110 M.P.H.

#### Fuel Data

Gasoline capacity upper wing 40 gal., fuselage 30 gal., total 70 gal. Gravity feed through 1/2-inch lines. Oil capacity 8 gal.

**BUTLER AIRCRAFT CORP.**

Kansas City, Mo.





# THE ZIMMER CODE

*A Marking and Identification System for Airways*

By Ludo L. Zimmer

JUST imagine yourself in an airplane flying one, two or even three miles per minute, looking down on the earth's surface from the height of a mile. You are headed for some distant point and your map shows the bee-line course you have drawn thereon to follow. However, you have to determine your position from time to time from what you can positively identify on the earth's surface as you proceed or you just don't arrive when and where you have planned.

Surface marking is one of the biggest jobs now confronting aviation progress for that large group looking and waiting impatiently to participate in non-transport air travel.

A limited number of fixed routes for daylight and fair weather flying for other than air mail, express, freight and passenger traffic (transport aviation) never can adequately serve inter-city and inter-state air travel. Since all ways are airways for aircraft, the logical procedure is to mark areas for identification with a code suitable to enable anyone anywhere to pick up his bee-line air route from the point where he starts and proceed directly to his destination. In order to fly a straight course, the pilot must repeatedly check his position en route.

The Zimmer code for surface marking and identification has been created to guide aircraft with the least effort to pilots and at a minimum cost for erection of markers.

On all standard maps and representations of terrestrial surfaces, positions are designated relative to the universal system of lines of latitude and longitude. Therefore, we start by creating on our world map flying lanes extending around the earth parallel to the equator and six minutes (6') wide. We designate ten such flying lanes each within one degree of latitude, and assign identification numbers to these flying lanes as follows: 0-1-2-3-4-5-6-7-8-9. To

each group of ten flying lanes, we assign a letter of the alphabet so that we avoid confusion from duplication of flying lanes. With this arrangement, there will be in the United States no duplication of symbols designating east and west flying lanes. The 26 letters of the alphabet serve to mark 260 flying lanes covering a latitude range of 26 degrees while the United States lies wholly within 24 degrees latitude.

Then we create north-south flying lanes in exactly the same way; each flying lane 6' wide, identified by a numeral (0-1-2-3-4-5-6-7-8-9), and each group of ten lanes by a letter of the alphabet. (See Basic Layout Chart of this system).

It is evident that, according to our layout, all surface positions lie at the intersection of some particular north-south and east-west flying lanes. We have, therefore, provided a marking and identification symbol to designate all surface areas to such degree of refinement as will adequately serve the traveler for the one purpose of positive position determination.

As a practical illustration of flying over terrain marked with our code, let us assume we take off from Hoover Field, Washington, D. C., and fly to Lambert Field, St. Louis. On our map layout, Hoover Field is located at the intersection of flying lanes L9 and Y2 (code LY92). Lambert-St. Louis Field is within the intersection of flying lanes L7 and L3 (code LL73). It is evident that our flight course will be over air lane L the entire distance; we will simply drift southerly from L9 to L7 en route, and when nearing our destination, watch for code marking LL73.

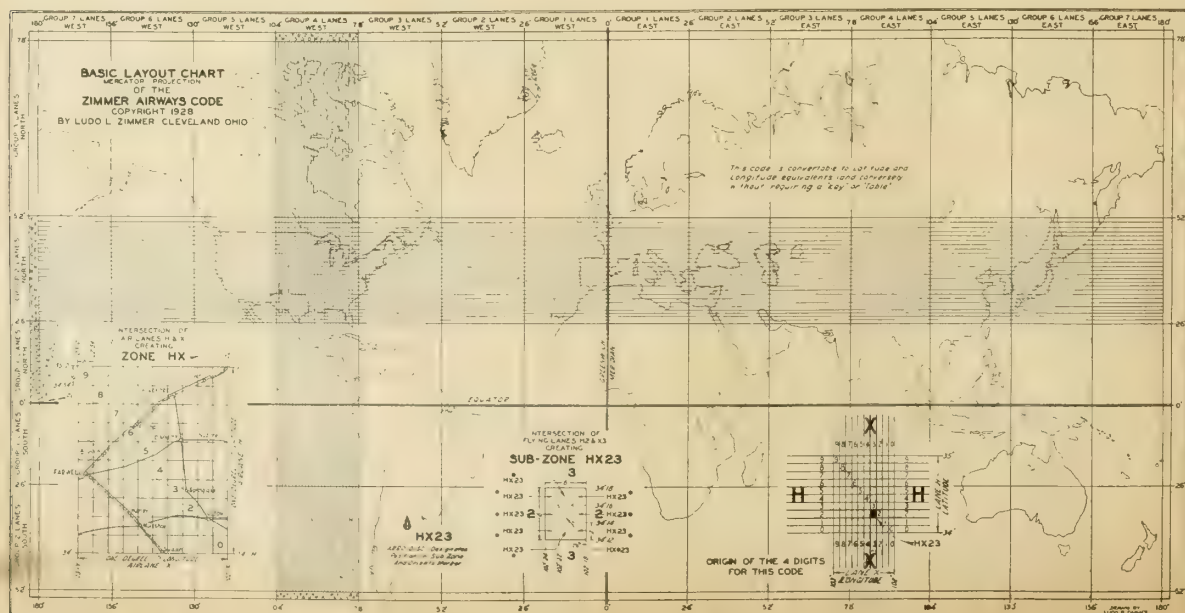
There are several limitations to other marking plans which this system overcomes.

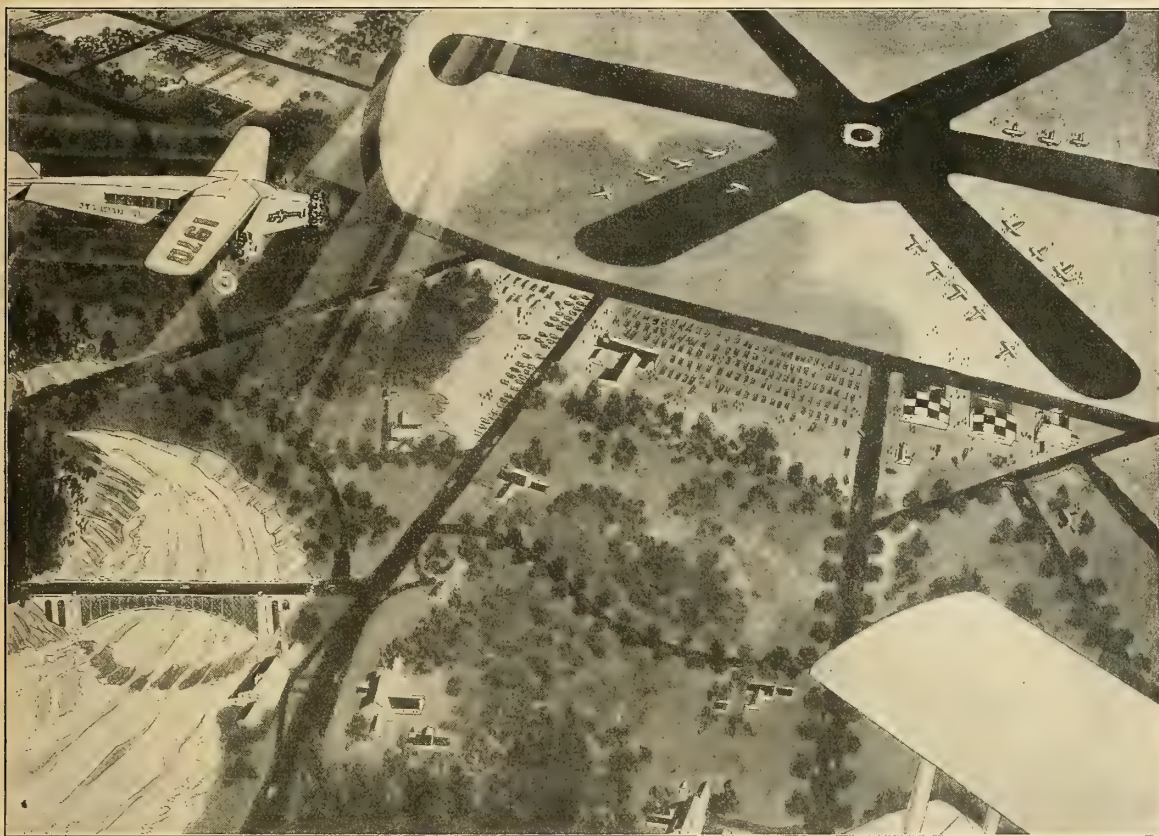
Towns and cities cover a relatively small area of the earth's surface. Therefore, a system of identification based on these named areas is necessarily limiting the possibilities for adequate surface marking. Then too, the town-name plan is cumbersome. It requires roof surface for long-name towns and entails construction costs that are prohibitive in expediting the rapid and extensive erection of these markers. The utmost service this plan can ever render is to meet the needs of aviation.

Towns and cities form a composite with no regularity of arrangement, one to the other, over the earth's surface. The pilot cannot determine position without constant vigilance and reference to maps. In the Zimmer code plan, any and all code markings have a positive and understandable relationship to all other code markings. If the pilot finds he is over HX23, for example, this information tells him his position on the map instantly and the town name at the same time—if marker is placed on a town roof. But, without referring to his map, he may know if he is over or off his desired course, because each letter and figure in this code has a definite position meaning or purpose; it is not a series of marks or letters meaning one thing only, like a town name. The regularity of all flying lanes, the arrangement of the numbers assigned to them and the regularity of position of these numbers being identical in each and every zone throughout the country, makes it possible for the pilot to fly for long intervals, only occasionally checking up with the map to verify his position.

For checking position in flight, a pilot at present must zig zag more or less between towns to read the town name, because for the major part of the distance the buildings

*(Continued on next page)*





## Give your fliers a smooth path into the sky

*To do what is expected of them, airports must be located as near as many good roads as possible. Tarviate your approach roads—and "distance from town" will cut little figure.*

**Tarvia**  
For Road Construction  
Repair and Maintenance

The *Barrett* Company

New York	Chicago	Philadelphia
St. Louis	Minneapolis	Boston
Detroit	Cleveland	Birmingham
Buffalo	Kansas City	Columbus
Providence	Syracuse	Milwaukee
Baltimore	Toledo	Cincinnati
Lebanon	Youngstown	Rochester
		Bethlehem

In Canada:

THE BARRETT COMPANY, Ltd.  
Montreal, Toronto, Winnipeg, Vancouver

FLIERS who have used the Tarvia runways at Dayton and elsewhere are enthusiastic about the take-off and landing surfaces at these modern airports. For Tarvia runways are resilient, mudless, dustless, frost-proof and skid-safe.

And they're economical . . . Since 1903, Barrett engineers have specialized in road construction and maintenance in all parts of the country. Their experience has taught them how to cope with local difficulties and utilize local materials to effect real savings.

Tarviate your runways, Tarviate your service roads, Tarviate your aprons. The Tarvia man at our nearest office will be glad to discuss details with you. Phone, write or wire.



(Continued from preceding page)

under the direct flight course are in open country and bear no map identification name like a town or city. Here the code plan supplies the identification marker just as truly as for the town and city buildings. This code plan supplies the prerequisites in a system to identify any and all positions on the earth where human beings are disposed to erect markers.

Our present U. S. Highway identification system is able to assign a number to each national highway and the traveler depends on checking his position en route from numerous other signs and may even stop, get out and ask just where he is, but no such system will suffice for the air traveler. Airway marking must be simple, positive, adequate and have high visibility. Bee-line air routes necessitate surface markings at practical distances in all directions so that the flier will find suitable surface markings for checking his position in all directions.

And what about position over large cities? Our large cities cover 100 square miles and up in area. That is a large area even for a pilot to cruise his plane over to establish position and then find the particular airport he wants to locate. How are these airdromes to be located? Fly around and read the names on hangar roofs until he finds the one he is looking for? Here again the Zimmer code provides for future needs as well as present. HX23, for instance, indicates where that surface area is located and one can predetermine the exact flying lane to it without confusion and without

searching. Multi-marking of the large cities to indicate definite areas is quite as essential as out in the open. Our code provides a marker to indicate these areas in a large city.

How about the confusion of names on roofs in the near future? Already the names of banks and merchandise are being displayed on roofs to be read by the air traveler. The four-digit code will be easy to pick out from the irrelevant roof advertisements.

And then, we should not underestimate the importance of cost of erecting markers and the cost of illuminating five to twelve letter words as compared with our concise code of 4 digits plus "Arro-Disc" to orient the pilot.

## FOG-FLYING POSSIBILITIES

*Abstract of a paper presented by Lieut. Alfred F. Hegenberger at the Aeronautic meetings, Society of Automotive Engineers, Chicago, December, 1928.*

**A**FTER explaining the nature and causes of fog and the reduction of visibility by it, Lieut. Hegenberger points out its far greater hazards to the airplane pilot than to persons on trains or ships, which can assure safety by stopping. Speeding through fog seems to give it greater opaqueness, and, although few fogs reduce the ground visibility to less than one-half mile, to the pilot at an altitude of 200

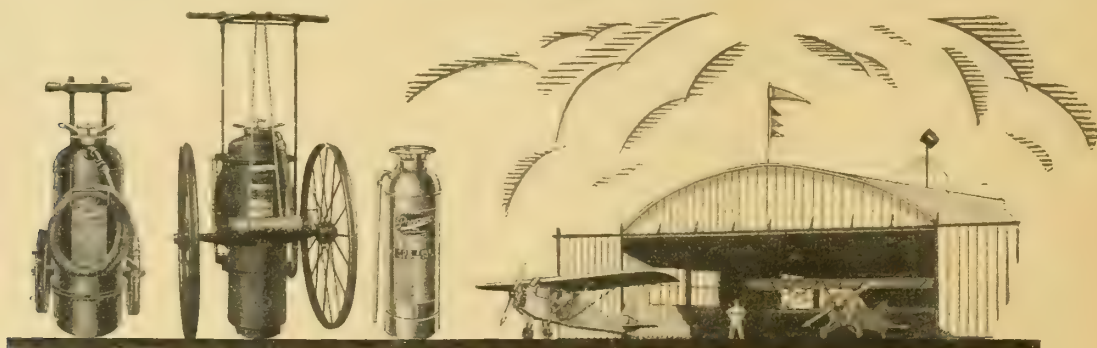
to 500 feet who is seeking to land, it might as well be nil.

Vision is the chief reliance of the pilot. Maintenance of straight level flight normally depends upon visual reference to the ground, the horizon or heavenly bodies, for without these aids the other senses are inadequate; hence, in blind flying recourse must be had to mechanical instruments.

Present instruments discussed include the turn indicator, the bank indicator, the air-speed indicator, and a flight indicator in which the foregoing three are combined in one unit.

Three series of fog-flying problems are discussed: (a) maintaining direction to the airport, (b) localizing the airdrome, and (c) the determination of altitude. Devices used for each of these purposes are considered and their limitations pointed out. Various existent and possible methods for determining altitude above ground include the present service-altimeter, and open-scale precision altimeter, and open-scale precision altimeter provided with an auxiliary barometric scale, the electrical-capacity altimeter, radio-wave reflection, and sound-wave reflection.

Fog penetration is greatest by radio waves and, in the visible spectrum, by yellow rays. Research into penetration by various wavelengths is being conducted at Wright Field. With frequencies outside the visible spectrum, two major difficulties are the obtaining of a sufficiently powerful source of emission and the developing of a selectively sensitive receiver that is rugged enough.



## Phomene Fire Protection for Aircraft Property

**A**FIRE in an airplane factory, hangar or airport building must be stamped out quickly.

Phomene extinguishers smother a fire with an air-tight blanket of foam. Once extinguished, the fire cannot reignite, because the foam blanket is still there; this is a very important feature in the extinguishing of the highly flammable type of fire.

Phomene (Foam Type) Extinguishers are supplied

in 2½ gallon, also 10 and 40 gallon on wheels—indoor or outdoor type.

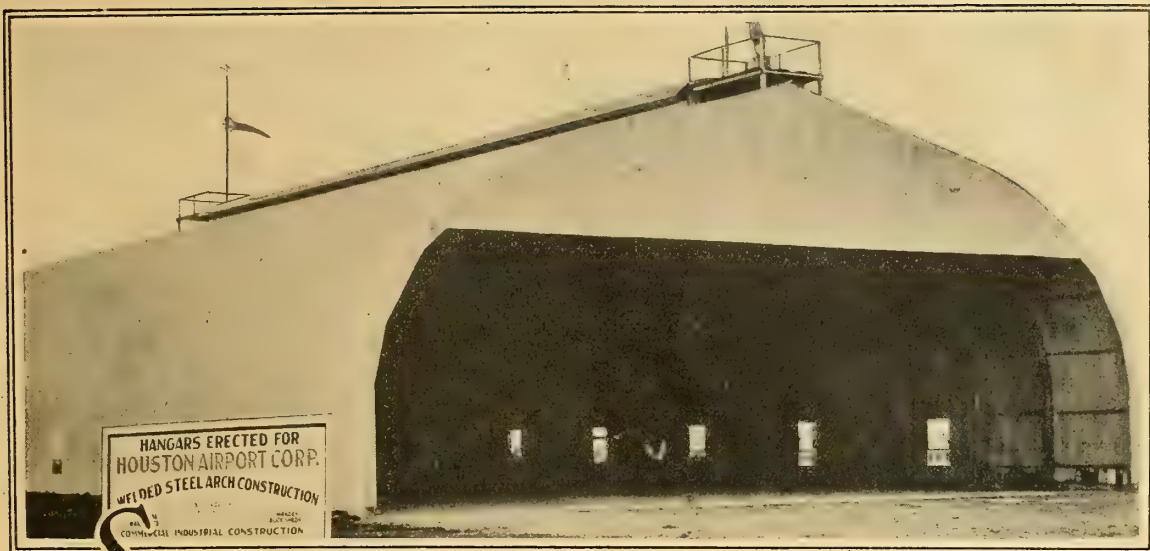
There is a type of *Pyrene* Fire Equipment for every fire hazard in every branch of aviation.

*Pyrene* Fire Equipment is sold through Airplane, Auto Accessory, Hardware and Mill Supply jobbers and retailers.

**PYRENE MANUFACTURING COMPANY**  
NEWARK, NEW JERSEY

Branches: Atlanta - Chicago - Kansas City - San Francisco  
Makers of Fire Equipment since 1907





# Savings Ahead....

## *with this low-cost weather protection*

**E**CONOMICAL weather protection is as necessary for hangars as that for industrial buildings . . . a field of service where rust-resisting ARMCO Ingot Iron has long been known for its low-cost per year performance.

Every department of industry reveals ARMCO Ingot Iron sheet and plate installations that have lasted through the years without repairs or replacements.

And there is a reason for this long life. Rust-promoting impurities are practically eliminated from ARMCO Ingot Iron. It is consistently and uniformly pure.

For roofing, siding and drainage parts ARMCO Ingot Iron is the long-time, low-cost sheet metal.

The office nearest you will gladly investigate your particular problem.



Top: A hangar of the Houston (Texas) Airport Corporation, covered with rust-resisting ARMCO Ingot Iron for lasting weather protection.

Below: The Bailey-Burrus Manufacturing Company, Atlanta, Georgia, where ARMCO Ingot Iron roofing and siding has served for 16 years without repairs or replacements.

Aside from roofing and siding for hangars and plant buildings, airplane manufacturers will find ARMCO Ingot Iron a ductile, durable iron for exhaust pipes, gasoline tanks, firewalls, and for other uses where sheet metal must be dependable.

### THE AMERICAN ROLLING MILL COMPANY

Executive Offices, Middletown, Ohio

Export: The ARMCO International Corporation  
Cable Address—ARMCO, Middletown, O.

#### DISTRICT OFFICES

Chicago	Detroit	Pittsburgh
Cincinnati	New York	St. Louis
Cleveland	Philadelphia	San Francisco



# ARMCO INGOT IRON RESISTS RUST





## Install the "Challenger" Engine in *Your Ship*—

### *It Gives You:*

**Smoothness:** The "Challenger's" unique arrangement of six cylinders on a two-throw crankshaft provides more perfect dynamic balance than is obtainable with any single row radial type of engine. For this reason the "Challenger" is exceptionally smooth in operation.

**Reliability:** One, two, three 50-hour runs on the block, plus hundreds of hours of flight-testing in the air—have established the unfailing reliability of the "Challenger" engine, a fact attested every day by "Challengers" in actual service.

**Economy:** Casey Jones on a recent 6000-mile transcontinental flight with a Curtiss "Challenger" averaged 11½ miles to the gallon of gas, without any expense for replacement or repairs.

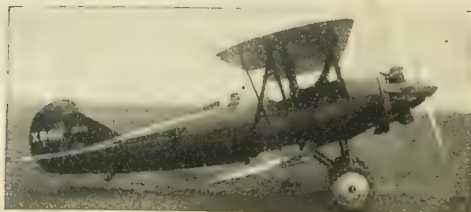
### *And—*

#### *Curtiss Engineering Cooperation*

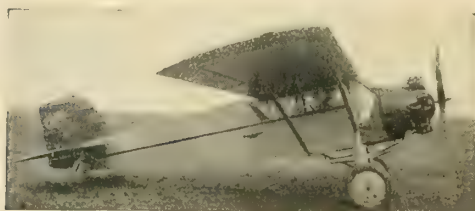
With every "Challenger" goes the assistance of the Curtiss Engineering staff in designing your installation so that the "Challenger" may bring to *your ship* 100% of its known smoothness, reliability and economy.

The "Challenger" is the product of the same engineers who have produced engines for the U. S. Army & Navy planes with noteworthy success. Now the "Challenger" affords the same kind of performance in commercial use.

Eight representative manufacturers have already purchased "Challengers" for immediate installation in their aircraft. If you want a "Challenger" for the coming season, better place your order now.



Travel Air; 3-place Open Cockpit Plane with Curtiss "Challenger" installed.



Robin; 3-place Cabin Monoplane with Curtiss "Challenger" installed.



Fledgling; Open Cockpit Training Type with Curtiss "Challenger" installed.



Fairchild; 5-place Cabin Monoplane with Curtiss "Challenger" installed.

## CURTISS FLYING SERVICE

INCORPORATED

GARDEN CITY, LONG ISLAND, NEW YORK

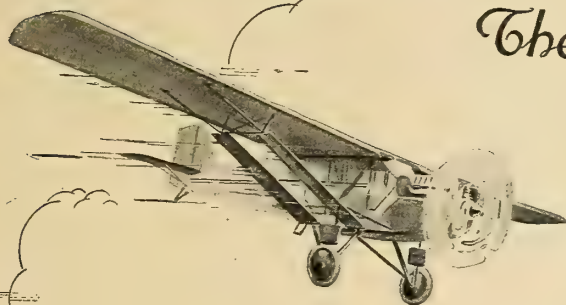
*Sole Sales Agents in United States*

Manufactured by Curtiss Aeroplane and Motor Co., Inc., Garden City, N. Y. Factories: Garden City and Buffalo, N. Y.

*Curtiss*



# For Profitable Flying Service The Curtiss Robin



Developed from Curtiss' twenty years of aircraft engineering and production experience . . . built to Curtiss quality standards . . . proved in service at Curtiss Flying Fields, the Robin is a profitable plane for flying service operators.

An inspection, or better still, a demonstration will convince you that the Robin has unusual stability, performance and durability. We shall be glad to send you complete information and the name of the nearest Curtiss Robin representative. Shall we?



## CURTISS FLYING SERVICE

INCORPORATED

GARDEN CITY, LONG ISLAND, NEW YORK

*Sole Sales Agents in United States*

Manufactured by Curtiss-Robertson Airplane Mfg. Co., Anglum, St. Louis County, Missouri



# TECHNICAL

## THE FLYING DUTCHMAN

**T**HE FLYING DUTCHMAN, a low-wing monoplane designed especially for sport and private flying, is a product of the Szekely Aircraft Corporation, Holland, Michigan. This new plane is intended to supply the demand for a light, single-place airplane in which quality of construction is combined with moderate cost and economy of operation.

Although this plane is of conventional steel fuselage and wooden wing construction, it embodies several new features. Among them is the localization of the dihedral effect at the tip of each wing. This is accomplished through the use of a special patented wing tip construction. The wing tip structure is a welded steel assembly fitted to the wing spars. The form so given to the wing reduces the scope and intensity of the wing tip vortices, retains the normal lift of the wing curve very nearly to the tip, and serves to maintain lateral stability in flight in the same way that a dihedral angle in the wing does. The steel framing also protects the wing from injury in event of accidental contact with another ship or the frame of a hangar door.

The Flying Dutchman is powered with the Sky Roamer, a three-cylinder engine which is also built by the O. E. Szekely Corporation. This engine together with the high-lift wing curve employed, enables the ship to take off in 75 feet.

The wing is of the true cantilever type, with box spars extending from wing tip to wing tip. These spars have spruce capstrips and mahogany plywood side pieces. The ribs are of spruce and are gusseted with plywood at all junctions. Both ribs and spars are formed in jigs. To avoid deformation the spars are kept clamped until the glue dries. To prevent possible fracture of the glue film in any joint all nailing is done before the glue sets.

Compression ribs are eight in number and are built up Warren trusses of steel tubing. The drag bracing is of square section steel tie-rod, which rarely requires adjustment after the plane leaves the factory. All fit-

tings are of the wrap type, enclosing the wing spars in their grip, and are mounted directly over the spreader blocks of the spars to insure a solid footing. The leading edge is a formed duralumin nose cap.

Fuselage is of the familiar Warren truss type. There are no welds in tension. The engine mount, which is welded from cold rolled steel plate and steel tubing, is attached to the fuselage by four chrome nickel steel bolts in double shear. The arrangement is such that the engine can be dismantled or replaced easily and quickly.

The landing gear is of the divided axle type. The axle is of chrome molybdenum tubing. Other tubing used in the ship is mild carbon steel. The wheels are 3 by 24 inches. Their spoke area is covered with fabric, doped and painted to match the plane. The tailskid is a leaf spring, with steel shoe. Rubber rings are used in preference to cord in the landing gear.

The entire plane is well streamlined. The cowling is all of aluminum. There are streamline shapes forward and aft of the cockpit, the rear one being padded as a head rest. To protect the pilot in case the plane should nose over, trussed arches of steel tubing inside these forms are firmly welded into the fuselage.

The cockpit is padded all round and finished inside with weatherproof upholstery fabric. A comfortable cane filled chair-body is provided as a seat for the pilot. Behind it is a luggage compartment. The throttle can be placed on either side of the cockpit. The throttle handle is a large ball shaped casting of aluminum, on which clothing cannot catch.

The engine cowling is fastened with snap clamps which can be loosened instantly, can be refastened in a second or two, and cannot be released accidentally. The cowling can be dropped for adjusting the carburetor or for access to the rear of the engine. Opening of four small panels permits all control cables to be inspected throughout their length and also permits inspection of their attachments and the

bell cranks and push pull rods to the ailerons.

The control surfaces themselves are of welded steel tubing construction and have streamlined steel horns. The tanks are located in the fore part of the fuselage, the gasoline tank above, hung in padded steel brackets, and the oil tank below, anchored to the floor forward of the firewall.

### Specifications

Span.....	26 feet
Chord.....	4 feet 8 inches
Length.....	18 feet
Height.....	7.6 feet
Wing area.....	108 square feet
Aileron area.....	14 square feet
Rudder and fin area.....	7 square feet
Elevator and stabilizer area.....	20 square feet
Wing curve.....	Gottingen 387
Wing loading.....	7.3 pounds
Power loading.....	19.4 pounds
Weight empty.....	540 pounds
Disposable load.....	215 pounds
Total weight.....	755 pounds
High speed.....	80 miles per hour
Cruising speed.....	70 miles per hour
Landing speed.....	25 miles per hour
Stalling speed.....	30 miles per hour
Rate of climb.....	500 feet per minute
Service ceiling.....	12,000 feet
Cruising radius.....	300 miles

## AIR-CLEANER FLAME-ARRESTOR

**E**NGINEERS of the AC Spark Plug Company have developed a dual air-cleaner flame-arrestor to reduce the hazard of carburetor backfire from airplane engines. According to the report of the National Board of Underwriters, who tested the device, no flame can be made to pass through the air-cleaner flame-arrestor even under the most severe conditions.

The device, attached to the intake of the carburetor, also prevents dust particles from reaching the engine. The dust, as it comes in contact with copper ribbons in the apparatus, adheres to the oiled surfaces and is retained there. The cleaning element should be washed in gasoline and re-oiled at regular intervals to maintain its efficiency.

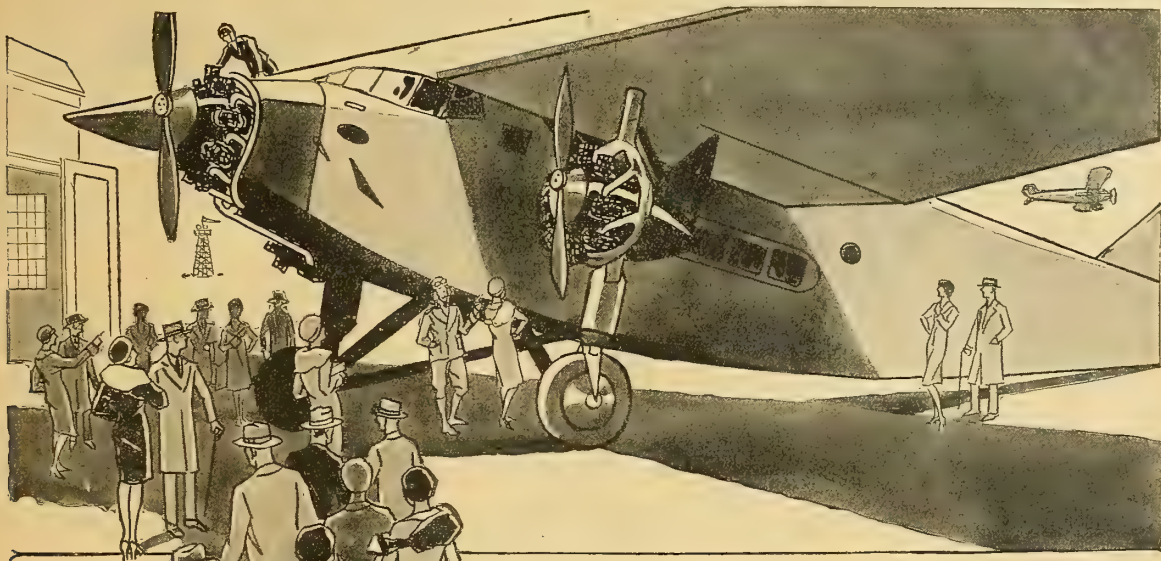
The principle of the flame arresting feature is the quenching of the flame by a material which will absorb it at such a rate that the gas is cooled below the point of ignition. This material consists of flat copper ribbon knitted and arranged in a container so that any flame emerging from the carburetor inlet must pass through it.

Copper is used because it has a heat conductivity nearly nine times that of steel. The flat knitted wires, which are arranged at all angles and inclinations, serve to diffuse the flame uniformly throughout the mass of material.

Engineers say the device also acts as an efficient muffler for carburetor noises.



The Flying Dutchman monoplane with a 40 h.p. Szekely engine



## Confidence...

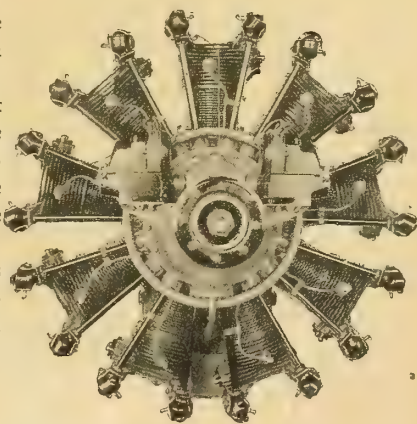
A WORD WRIGHT HAS  
PUT INTO FLYING

THE general public has become familiar with the safety and endurance of the record-making Wright Whirlwind J-5 Engine. Trans-oceanic and trans-continental flights brought home these facts and established a widespread confidence.

The position of the Wright J-5, therefore, becomes more deeply entrenched as plane manufacturers and commercial air-line operators sense the confidence exhibited by the public.

Behind these J-5 Engines stands a nation-wide Service Organization reaching into every aviation center.

*The public knows and trusts  
Wright Engines*



*The* WRIGHT  
WHIRLWIND  
J-5  
AERONAUTICAL  
ENGINE



WRIGHT AERONAUTICAL CORPORATION, Paterson, New Jersey, U. S. A.

CANADIAN WRIGHT LIMITED, Sole Licensees for Canada, Montreal

AUTHORIZED PARTS DEALERS

Air Associates, Inc., Curtiss Field, Long Island, N. Y.

Pacific Aeromotive Corp., Los Angeles, Cal.

Stout Air Services, Inc., Dearborn, Mich.

# WRIGHT

*The first name in flying*





## BURNELLI MONOPLANE

**T**HE Burnelli monoplane airliner was built to demonstrate the fact that transportation by air is on a competitive basis with other methods of transportation. The plane will be flown all over the country and its records compiled in order to establish the legitimate comparison. This all-metal plane was built for Mr. Paul Wadsworth Chapman of New York and Chicago. Mr. Chapman is one of the best known financiers in this country. The Airliner was designed by Vincent J. Burnelli, who supervised its construction at Keyport, N. J., in the Aeromarine factory which was leased for the purpose. The plane was brought to the Newark Airport on barges and by trucks, and re-assembled in the Airport hangar.

On Tuesday, January 8th, Lieut. Leigh Wade, famous Round-the-World flier, flew

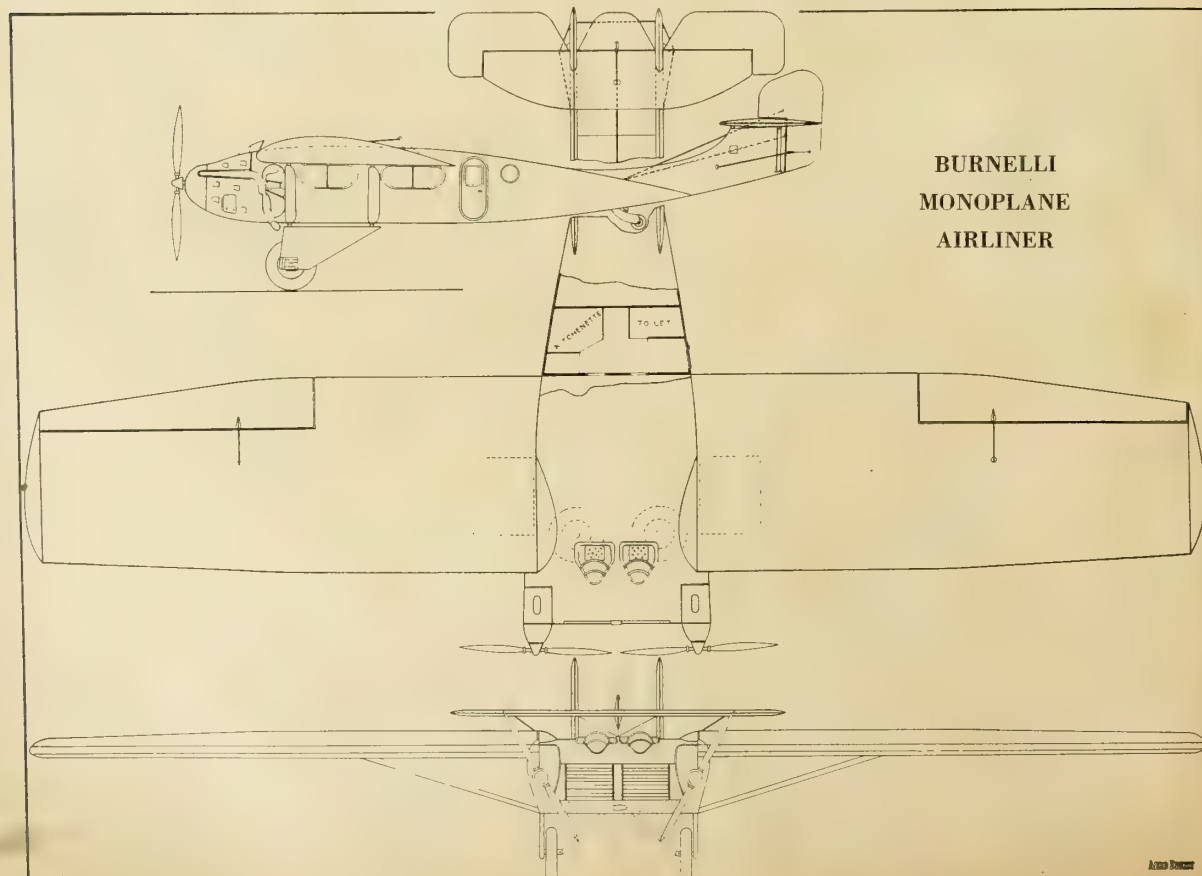
the ship for a total of 61 minutes in 4 flights. The field was frozen, the temperature being 18 degrees and there was a wind of about 15 knots. The first flight was made carrying only Lieut. Wade and Capt. E. F. Stewart, the assistant pilot. The ship took off in 147 yards and was in the air after 6 seconds from the time she was given the gun. She climbed to 3,000 feet in 7 minutes but Lieut. Wade kept the engines throttled down to two-thirds of their power. On the second flight with 5 passengers the ship took off in 7 seconds for less than 100 yards' run. On the third flight the take-off with 12 passengers required 9 seconds. On this flight the ship flew over lower New York. On the fourth flight, with the same number of passengers the take-off was from the other end of the runway and was about the same as the third. The ship landed at an average of

less than 50 miles an hour and came to a short stop, never taxiing more than 100 yards, although brakes are not yet fitted.

The Airliner will be sent on a number of cross-country test flights after Lieut. Wade has completed the Department of Commerce tests. It has visited Philadelphia, and will also be flown to Washington, Chicago and San Francisco. All these will be non-stop flights and a full complement of passengers will be carried.

The fuselage, which is 36 feet long and 12 feet wide, has a lift of 4 pounds per square foot. Owing to its unusual design it reduces the landing speed at least 12 per cent, this resulting from the air cushion it produces as it nears the ground. The wings are calculated to have at least  $14\frac{1}{2}$  pounds per square foot lift and have been tested to support a

*(Continued on next page)*



**BURNELLI  
MONOPLANE  
AIRLINER**

# Travel Air smiles and grows

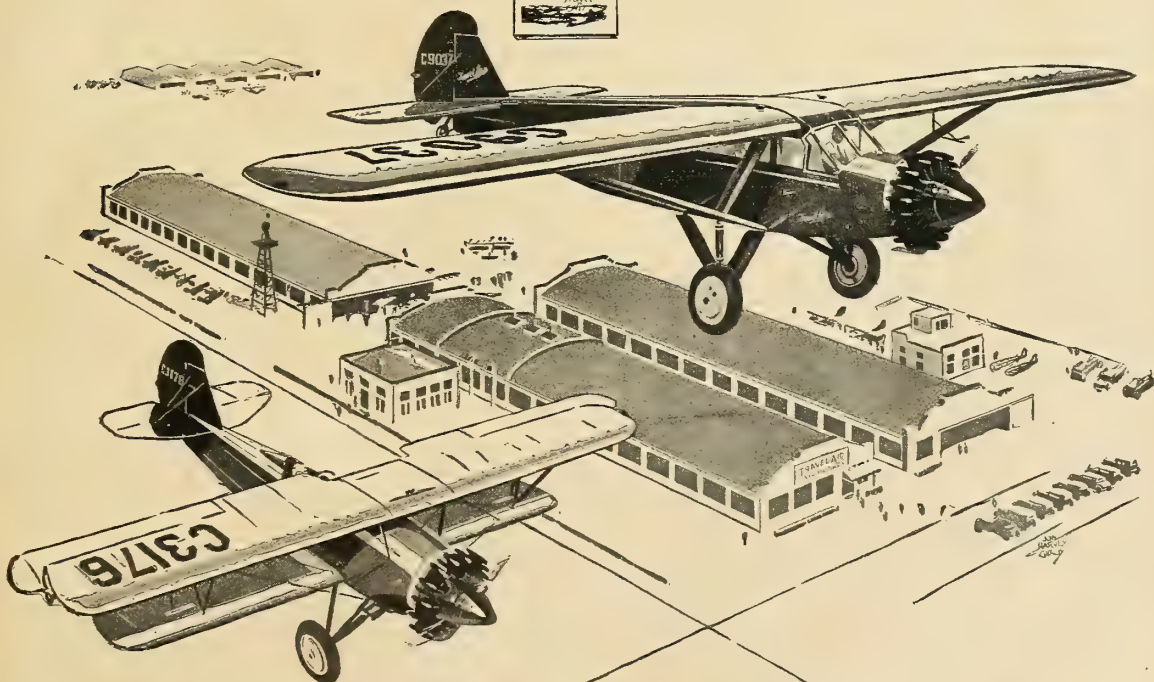
Closing 1928 with a record volume of sales, we start 1929 (our 5th year) in a prosperous condition and in a happy frame of mind. ¶ Travel Air has been kept constantly in the public's eye through outstanding performance. Our Cabin Monoplane, "The Limousine of the Air," has met with enthusiastic approval everywhere. All Travel Air types have been improved and refined. Powerful New York financial interests have become associated with us. A third unit to our factory is being built. More than 116 Travel Air distributors and dealers have become firmly established. They have already signed contracts for their 1929 requirements far exceeding the 1928 total. ¶ Distribution through distributors and dealers is our firm

sales policy. ¶ The rapidly increasing interest of business men in aviation affords an unlimited market in the building of airplanes adapted to business use with *performance, dependability and safety* as their outstanding features. ¶ That's the kind of airplanes we have built and will continue to build. ¶ We have a large, modern factory; long years of flying experience; skilled engineers; ample finance; and we've always stuck to proven and exacting standards of construction. *That's why we have never had a structural failure in the air.*

WALTER H. BEECH, President  
TRAVEL AIR MANUFACTURING CO.



ON REQUEST—Catalogue and story of Travel Air illustrating and describing eight open cockpit biplanes and the Cabin Monoplane.



**TRAVEL AIR MFG. CO.**  
*The Standard of Aircraft Comparison*  
**WICHITA, KANSAS**



(Continued from preceding page)

load of 28,000 pounds

The wings, of an unusual and novel construction, are the design of Mr. Burnelli. They are of the "transverse stringer" type of construction, requiring no ribs. Stringers run from end to end and the whole is covered with corrugated sheet duralumin. There are drag trusses located at intervals in the wings.

Two fuel tanks of 280 gallons each are set in the wings and the third tank of 440 gallons is located in the cabin. Additional tanks may be installed when required.

The furnishings and equipment of the cabin have been designed to be the most luxurious ever seen on an airplane. The Adapto upholstered chairs are set on swivels and can be made to assume any position from upright to recumbent. They are wide, roomy and built for comfort. The whole interior of the cabin is upholstered in grey. In the centre of the cabin is a large lounge, built over the main fuel tank.

In the rear of the cabin is a kitchenette and also a toilet room, one to starboard and the other to port. Both are complete in every particular. Monel metal has been used extensively in these compartments and this with dural and aluminum gives a smart effect. In a panel at the rear of the cabin are the radio controls which are readily accessible. The radius of operation of the radio broadcasting set is 300 miles.

The cabin is soundproofed with Balsam Wool and the mufflers especially designed for the engines, diminish the engine noise and make the Airliner as quiet as an auto-



The Burnelli monoplane with wheels retracted in flight

mobile. There are electric lights throughout, the main lights being set in the ceiling, and several base plugs for reading and writing lights. Owing to the design of the plane it will be possible to write with ease and comfort. Electric cigar lighters are provided.

The cabin dimensions are 18 feet long by 11 feet 4 inches wide by 5 feet 6 inches high.

This is the first large passenger-carrying plane to be fitted with a retractable landing gear. When in the air the pilot or mechanic can retract the wheels into the fuselage by the simple turning of a lever. This lever indicates the position of the wheels and to make error impossible there is a red electric light which is visible to the pilot all the time the wheels are retracted or drawn up. Wheels may be completely retracted in 17 seconds and extended again in only 8 seconds.

A 2,700,000 candlepower retractable landing light is inserted under the fuselage nose.

The Curtiss "Conqueror" motors are the result of 12 years of experimental work and are considered to be the finest examples of their kind in the world. They are mounted on a triangular frame and can be swung out from the vertical line with ease. This

allows replacements or repairs without tearing down the power plant. The motors are set on "pads" which reduce the vibration.

The 10'-11" Hamilton dural propellers are set at such an angle that the plane can be flown with only one in operation without requiring correction by the use of the rudders; the angle is such that the slipstream acts to keep the plane on an even course. In other words, a direct course can be flown with only one engine working.

Rudders and elevators are set high above the slipstream and suffer no interference from this source, making it possible to obtain adequate control without considering the wind stream.

With 20 passengers the Airliner will make more than 800 miles in 7 hours at its mean cruising speed, 115 m.p.h. With 12 passengers it will make close to 2,400 miles at the same speed. With the calculated overload of fuel it will make 4,000 miles at 115 m.p.h., or more than sufficient to take it non-stop from New York to San Francisco, Cal., or London, Eng. With the wheels retracted the plane has actually climbed 1,000 feet in 4 minutes on one engine.

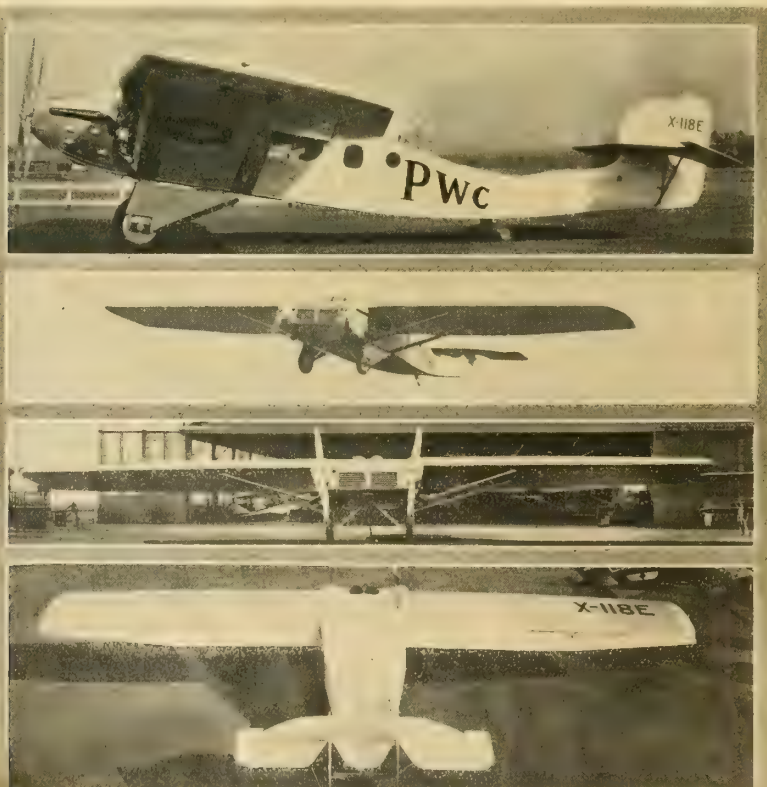
To allow long flights several pilots may be carried. There are doors through the bulkhead into the pilots' cabin and two windows through which the passengers may see the pilots in their seats. There is dual control throughout and everything is mechanically operated. The stabilizer is adjustable and the elevators and rudders are balanced so as to make their operation easy. There is no sight obstruction forward, overhead or to the rear.

Four long sliding unbreakable glass windows are provided in the main cabin and a small round window in both the kitchen and toilet rooms; all these may be opened.

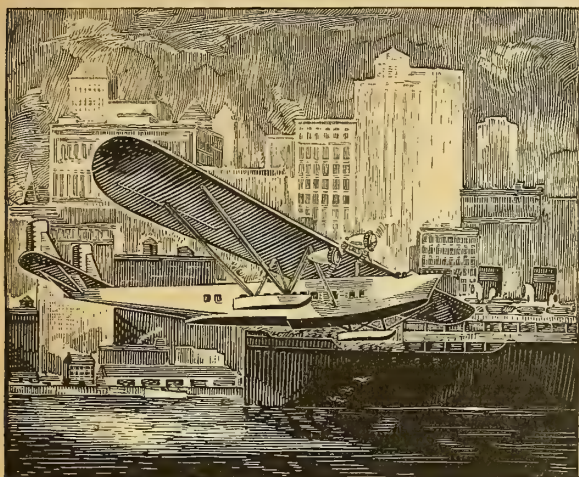
The Airliner is owned and operated by Sky Lines, Inc.

#### Specifications

Wing span .....	90 feet
Chord .....	14 feet
Length overall .....	47 feet
Weight (without gas) .....	8,700 pounds
Useful load with 7 hours' fuel ..	4,000 pounds
Normal speed .....	115 miles per hour
High speed .....	145 miles per hour
Fuel capacity .....	1,000 gallons
Radius with full fuel load (cruising speed)	2,400 miles
Radius with fuel overload .....	4,000 miles
Passengers with 7 hours' fuel .....	Twenty
Passengers with 20 hours' fuel .....	Twelve
Luggage allowance (20 passengers)	45 pounds each
Landing speed (full load) ..	52 miles per hour
Landing light .....	2,700,000 candlepower
Engines (two) .....	625-700 horsepower each



Views of the 12 to 20 passenger Burnelli monoplane airliner



MORE passengers, more mail and more merchandise will be carried by air transport this year than ever before. The increased traffic will necessitate the expansion and extension of existing transport services, and will furnish profitable markets for new lines.

# THE COMMODORE



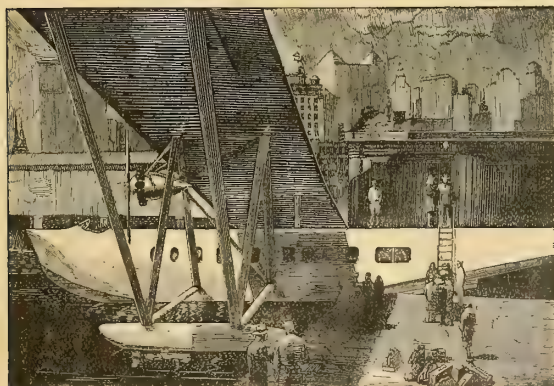
To make more economical the present operation of air transport and to promote a more far-reaching public confidence... increased pay loads must be carried, greater distances covered, and schedules maintained more regularly—with unprecedented dependability and safety.

The Commodore—a new and distinct type of flying cabin cruiser—meets these growing demands of commercial aviation, particularly over water.

In design and construction, The Commodore is the same as the highly efficient Consolidated Navy Patrol Plane XPY-1, except that the hull shape of The Commodore above the water line has been modified to accommodate comfortably thirty-two passengers, in addition to baggage, toilet and radio compartments. Three Pratt and Whitney Wasp engines provide the motive power, producing a high speed of one hundred and thirty miles an hour and a cruising speed well over one hundred miles an hour.

To established transport operators, individuals or organizations contemplating air transport service, we will be glad to furnish facts and figures... a detailed survey showing how The Commodore can comply with any particular phase of transport work.

Consolidated Aircraft Corporation, Buffalo, N. Y.





# CURTISS CONQUEROR ENGINE

**D**URING the past few years, when the question of the relative merits of air-cooled and water-cooled motors has become increasingly important, the Curtiss Aeroplane and Motor Company has continued with the development of the water-cooled Vee type of motor, as being most satisfactory for certain uses. This has been due, in great measure, to the remarkable service record of the Curtiss D-12 motor. The high power, low weight, small frontal area, and compactness of the D-12 was instrumental in the development of the Army's fast and highly maneuverable pursuit, observation, and attack planes, which today are acknowledged as the world's finest.

The development of the Conqueror engine, therefore, has followed the same basic design as the D-12. Improvement and refinement have resulted in the Conqueror producing 600 horsepower as against 435 for the D-12, with no increase in frontal area, no increase in overall dimensions, and only 50 pounds increase in weight, but at no sacrifice of reliability and ruggedness, which have been outstanding characteristics of the D-12.

Perhaps the best example of the remarkable performance of the Conqueror is afforded by the standard 50-hour government block test. This test was completed in five successive days, the engine having been run for 10 hours straight each day, at full throttle, developing 600 horsepower at 2,400 r.p.m. There were no stops or adjustments of any kind made during the entire test, a truly remarkable record for such a severe test. The engine power was found to have increased about 1% at the conclusion of the run; gasoline consumption averaged only .512 pounds per horsepower; and oil, .0024 pounds per horsepower, indicating clearly the possibilities of low fuel consumption.

Two models of the Conqueror engine are furnished, the direct drive and the geared, and both have been thoroughly proved in actual service. In the National Air Races

at Spokane in 1927, two Curtiss Hawk pursuit planes, powered with Conqueror engines, took first and second places in the premier event of the meet, the winning Hawk having averaged over 200 miles an hour. During the same meet, two Curtiss Falcon observation planes, powered with Conqueror engines, took first and second places in their event at speeds that far outstripped other observation types, the winner averaging over 170 miles an hour.

The geared model of the Conqueror is provided with the latest development in reduction gear design. The satisfactory operation and reliability of this gearing have been thoroughly proved both by dynamometer tests and actual flight tests. The geared Conqueror engine weighs only 90 pounds more than the direct drive model.

The performance of the geared model was thoroughly proved in the flight tests of the new Curtiss Condor bomber, powered with two Conqueror engines. This plane, has a high speed of 130 miles an hour and service ceiling of more than 15,000 feet. After 75 hours of flight testing, the Conqueror engines in the Condor were disassembled and found to be in perfect condition throughout.

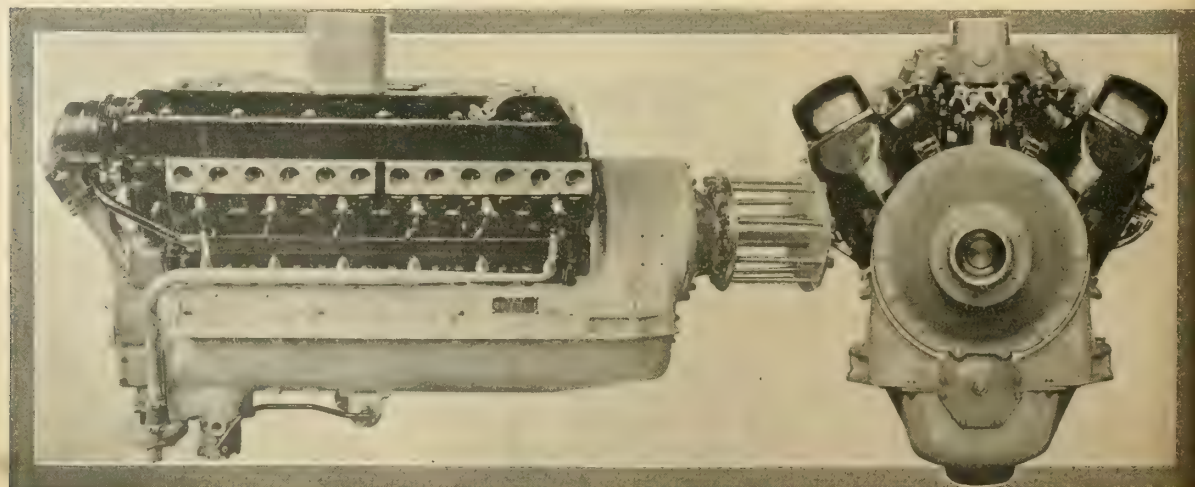
For commercial use, the Conqueror engine covers a wide field. The direct drive model, at 1,750 r.p.m., develops 450 horsepower, thus providing more power than a standard Liberty engine, with approximately 150 pounds less weight and far less frontal area. The engine may be used at propeller speeds of from 1,750 to 2,400 r.p.m., depending on the type of engine; and one of its most marked characteristics is its exceptionally smooth running at any speed. Two of the geared type are used in the new commercial monoplane built for Mr. P. W. Chapman by Vincent J. Burnelli.

CHARACTERISTICS, CURTISS GEARED V-1550 ENGINE  
 Rated horsepower...600 at 2,400 (crankshaft) r.p.m.  
 Number of cylinders.....12  
 Bore.....5½ inches  
 Stroke.....6¼ inches  
 Displacement of engine.....1,569 cubic inches

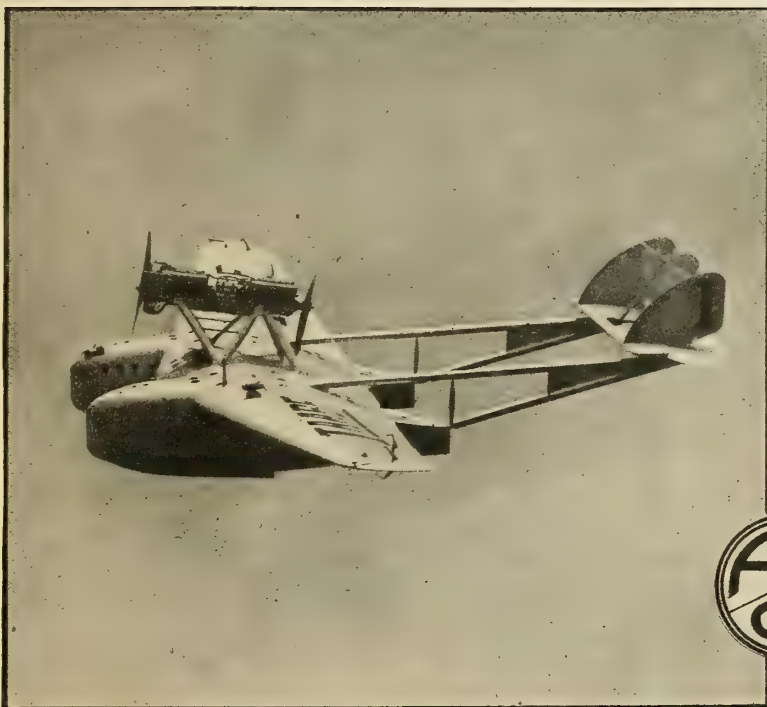
Ratio of gear reduction to propeller.....2 to 1  
 Ignition system.....Splitdorf magneto  
 Carburetor.....2 Stromberg NA-Y6D  
 Maximum oil inlet temperature.....160 degrees F  
 Oil consumption......015 pounds per b.h.p. hour  
 Fuel consumption......53 pounds per b. h. p. hour  
 Weight of engine dry.....845 pounds  
 Rotation of propeller.....Counter-clockwise  
 Length of engine.....56¾ inches  
 Width of engine.....26 inches  
 Height of engine.....35¼ inches

## BOOKLET ON AMERILAC DOPE AND LACQUERS

**A** TWENTY-FOUR-PAGE loose-leaf booklet, with pages 8½ by 12 inches, has been produced by the American Varnish Co. of Chicago to illustrate the practical application of Amerilac color combinations to airplanes. Each of the 24 pages shows a Stearman biplane (in flight) on which various colors are displayed on wings, body and tail surfaces. The particular color combination illustrated is listed at the bottom of the page, so that it is possible to select the colors desired with a good idea of how they will appear on the finished airplane. The illustrations, printed on heavy coated paper, show the following colors in combination, the first named color in each instance being shown on the fuselage and landing gear, the second on the wings, elevators and stabilizer:—orange and varney blue; cardinal red and apple green; Western Air red and Ewer green; maroon and light brown; dark maroon and canary yellow; light cream and deep cream; deep cream and light cream; desert sand and light cream; canary yellow and Ewer green; gull gray and deep cream; warbler gray and light brown; falcon gray and gull gray; biege brown and gull gray; light brown and orange; golden brown and desert sand; thrush brown and golden brown; apple green and canary yellow; tree swallow green and apple green; Ewer green and desert sand; varney blue and canary yellow; varney blue and desert sand; blue and canary yellow; swallow blue and light cream; swallow blue and canary yellow.



Starboard side and propeller end views of the geared type Curtiss Conqueror engine



Photograph shows Model S-55 in flight

# American Aeronautical Corporation

## 730 Fifth Avenue

## New York

**T**AKES great pleasure in announcing its plans for the manufacture in the U.S.A. of the world famous Savoia-Marchetti Flying Boats and Amphibians.

These flying boats have made such remarkable showings in the past 10 years that we feel their achievements should be allowed to speak for themselves.

We give below a summary of the different records and performances made:

First crossing of the Alps in a seaplane: July, 1929.

Schneider Cup: Won at Bournemouth, in September, 1919, with seaplane S-13.

Schneider Cup: Won in Venice, in September, 1920, with seaplane S-12.

Flight: Sesto Calende-Stockholm-Rhiga-Reval-Helsingfors-Aaland Isles. Commander Maddalena broke the world's record for distance in seaplanes, with "Savoia" S-16.

World record for seaplane speed: 173.97 M.P.H. with seaplane S-51, December 28th, 1922.

Flight: Sesto Calende-India-Australia-Japan-Rome-South America-North America-Rome (60,000 miles), 1925, in seaplane S-16 with Commander de Pinedo.

Flight of the Two Americas, in May-June, 1926, with seaplane S-59, by Messrs. Duggan and Olivero.

World records attained by our pilot, Mr. Alex-

ander Passaleva, in Savoia-Marchetti Seaplane (bombarment type) S-55 during 1926:

Without payload .....	621 miles; average, 103.31 M.P.H.
With 1,102 lbs. payload ..	621 miles; average, 103.31 M.P.H.
With 2,204 lbs. payload ..	621 miles; average, 103.31 M.P.H.
	Time of flight—6 hours, 39 seconds.
With 4,408 lbs. payload ..	621 miles; 6 hours, 39 seconds.
	Speed for 62.1 miles—109.21 M.P.H.
	Speed for 310.5 miles—107.75 M.P.H.
	Speed for 621 miles—103.31 M.P.H.
	Altitude .....
	10,696 ft.
With 6,612 lbs. payload ..	Record for heaviest cargo carried at 6560 feet.

Seaplane Savoia-Marchetti (scouting and bombarment) S-59: with 1102 lbs. payload—altitude, 20,195 ft.

Seaplane Savoia-Marchetti (scouting and bombarment) S-62: with 1102 lbs. payload—310.5 miles; average, 118.38 M.P.H.; with 2204 lbs. payload—62.1 miles; average, 120.62 M.P.H.

Transatlantic flight in Seaplane S-55, with Commander DeBarros, in April, 1927.

Commander DePinedo's flight of 60,000 miles all around the world, including crossing of the Atlantic in both directions in 1927 in Model S-55 double hull monoplane with two 500 H.P. motors in tandem.

*Visit our exhibit at the Aviation Show, Grand Central Palace*



# BOEING B-1E FLYING BOAT

**T**HE low broad hull of the Boeing Flying Boat Model B-1E accommodates a roomy, glass-enclosed cabin which is comfortably arranged to seat five passengers and a pilot. It is 52 inches wide, 9 feet 3 inches long, and 50 inches deep. This gives space in the rear of the cabin for a deeply upholstered single seat of the lounge type, wide enough for three. In front of this, two individual seats, built of metal, and like the lounge, attractively upholstered in leather, are arranged side by side, separated by a wide aisle. The forward position of the cabin and the size and arrangement of the windows are such as to provide a practically uninterrupted field of vision for the passengers as well as the pilot, a feature which makes the flying boat desirable for scenic trips and photographic work.

As in a modern automobile, the windows can be partially or completely opened. The front windshields, which slope back from the center towards the sides of the cabin, are hinged from the top and may be swung out to any point desired. All windows are of non-shatterable safety glass.

The walls and ceiling of the cabin are lined with an attractive brown fabrikoid which harmonizes with the walnut woodwork and leather upholstery. Every detail of the interior is carefully finished, and a large dome light is provided for night flying. The construction of the cabin is such that the noise from the engine is almost eliminated. The cabin is accessible through four hatches in the roof, so that the passengers can reach their seats without inconvenience.

Baggage and equipment are carried in a separate compartment just aft of the rear bulkhead of the cabin, which is accessible through a hatch in the deck.

The ship is equipped with navigating lights, and a compartment is provided for anchor gear.

One 40-gallon fuel tank can be installed in the baggage compartment, giving a total fuel capacity of 120 gallons. This fuel can be pumped into the tanks in the upper wing by means of a wabble pump operated by the pilot. The standard oil tank has a capacity of 10.5 gallons. This will give a five hours'

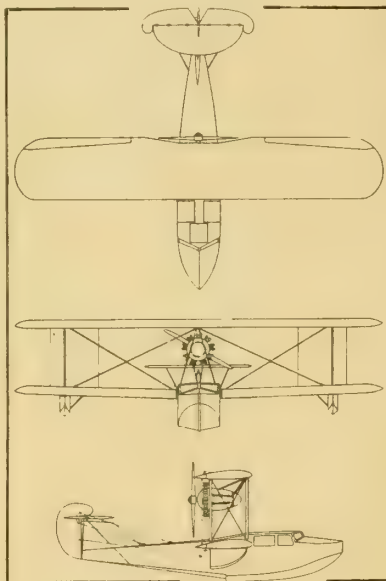
fuel supply at cruising speeds, with a range of about 450 miles.

The structure of the hull is wood. Ribs are solid, and covering is entirely with mahogany plywood.

Wing spars are of solid spruce, and covering is with fabric. The Boeing 103 wing section is used.

The engine nacelle is built up of steel tubing.

Standard equipment includes a Hamilton wood propeller. Electrical equipment includes an electric inertia starter, battery,



Outline drawings of the Boeing B-1E

generator, volt and ammeter, and control box.

The following instruments are installed: compass, bank and turn indicator, air-speed meter, altimeter, tachometer, clock, oil pressure gauge and oil temperature gauge.

Conventional wheel and rudder bar air controls are used.

The hull is finished in natural mahogany, the wings and tail surfaces in aluminum,

and top side of upper wing and bottom side of lower wing in chrome yellow.

## Dimensions

Length over all.....	32 feet 6 inches
Height over all.....	12 feet
Wing span, upper.....	39 feet 8 inches
Chord, upper wing.....	79 inches
Chord, lower wing.....	79 inches
Stagger .....	None
Dihedral, lower wing.....	2 degrees
Incidence .....	None

## Areas

Wing area, incl. ailerons.....	470 square feet
Aileron area .....	38.4 square feet
Stabilizer area.....	26 square feet
Elevator area.....	28 square feet
Rudder area.....	21 square feet
Fin area .....	14.5 square feet

## Weights

Weight empty .....	3,090 pounds
Useful load .....	1,460 pounds
Pilot .....	180 pounds
Fuel (80 gallons).....	480 pounds
Oil (7 gallons).....	50 pounds
Actual pay load.....	750 pounds
Gross weight loaded.....	4,550 pounds

## Performance with Full Load

High speed.....	115 miles per hour
Landing speed.....	59 miles per hour
Rate of climb.....	1,000 feet per minute
Climb in 10 minutes.....	5,600 feet
Service ceiling .....	12,000 feet
Take-off run .....	900 feet
Take-off time .....	23.4 seconds
Wing loading.....	9.68 pounds per square foot
Power loading.....	11.09 pounds per horsepower

## PORTER SHEAR CUTTER

**T**HE Porter shear cutter is a portable tool which can be carried to the job anywhere. It embodies the same power multiplication principle of lever and toggle joint which characterizes all Porter models. It is capable of cutting with comparative ease, flat bar steel up to  $1\frac{1}{2}$ "  $\times$   $\frac{3}{8}$ " or wire rope up to  $\frac{5}{8}$ " in diameter—work which heretofore could be done only with a hacksaw or with bench or power tools. Originally developed by H. K. Porter, Inc., of Everett, Mass., for the aeronautical department of a large foreign government, this tool is now released for general sale.

## HEAVY DUTY DRILL

**I**N response to demands for a powerful, low speed,  $\frac{3}{4}$ -inch heavy duty drill for continuous, heavy duty service, The United States Electrical Tool Co., Cincinnati, now has quantities of this type in the hands of jobbers and supply houses. A universal motor operating on alternating or direct current of sixty cycles or less pulls this drill at 350 revolutions per minute, load speed. In all other respects, it is typical of U. S. drills: SKF ball bearings; chrome nickel steel gears, hardened, running in grease; double silk-insulated, enamelled, armature wire; one-piece, aluminum body frame and commutator head; quick make, quick break, two-pole trigger switch; three-jaw screw back chuck for straight shank drill bits, etc. This model weighs 27 pounds.



Side view of the Whirlwind-engined Boeing B-1E flying boat

# The HISSO-WACO

*Quick take off . . . Rapid climb*  
*High cruising speed . . . low landing speed*

The WACO powered with Hispano-Suiza 150 and 180 h.p. motors is demonstrating the same quality of performance responsible for the winning of the season's major air events.

The performance naturally is superior to the faithful OX-5. But the price is only slightly higher . . . in the neighborhood of \$4,000 thoroughly equipped. We believe that the HISSO-WACO meets a definite need at this time for a moderately priced commercial airplane with better than average performance characteristics and remarkably low maintenance cost.

\* \* \* \*

*Write for complete information on the other*

**1929 WACOS**

THE ADVANCE AIRCRAFT COMPANY . . . TROY, OHIO





# CABINAIRE BIPLANE

**T**HE Cabinaire is a four-place cabin biplane built by the Paramount Aircraft Corporation of Saginaw, Michigan. Designed especially for private operation and for service on feeder airlines, it is one of the few small cabin biplanes now in production.

The plane is powered with latest improved Warner Scarab engine, which furnishes 110

horsepower at 1,850 revolutions per minute.

Wings are of laminated spruce construction, affording exceptional rigidity. Square internal tie-rods are employed throughout. In the first bay, conventional double wiring is used. All strut fittings are U-type bottom, welded on each side. Streamlined wires are used for trussing.

Two aluminum fuel tanks located in the

upper wings each have a capacity of 21 gallons. By removing two turnbuckles, these tanks may be dropped out for inspection. Ailerons are balanced and are similar to the wings in construction. They operate independently. Both the wings and fuselage are completely wired for navigation lights.

Fuselage is of welded steel tubing. To prevent twist, contradiction or loss of alignment, all welding is done on a jig. After the removal of the fuselage from the jig, no more welding is done. Any openings in the welding are sealed to prevent internal oxidation. To avoid any possible weakening of members, no drilling is done on the fuselage. In the fuselage structure, various grades of steel are used, the quality of each being especially adapted to the purpose it serves.

The entire empennage is constructed of welded steel tubing. The stabilizer is adjustable from the pilot's cockpit. Even with maximum load, the adjustment may be made easily. The tail surfaces are of sturdy construction throughout. All surfaces (with the exception of the rudder) are operated by tube control. The rudder is operated by conventional cables.

The landing gear is equipped with Bendix wheels and self-energizing waterproof brakes. The brake control is a novel and exclusive feature of the Cabinaire; they are operated from the control stick by two butterfly bars. Their operation, however, is entirely independent of that of the control stick. Both brakes may be applied together or singly. Aerol struts capable of carrying a shock weight of 2,200 pounds are standard equipment. The tail skid is of the spring type, with a manganese steel shoe.

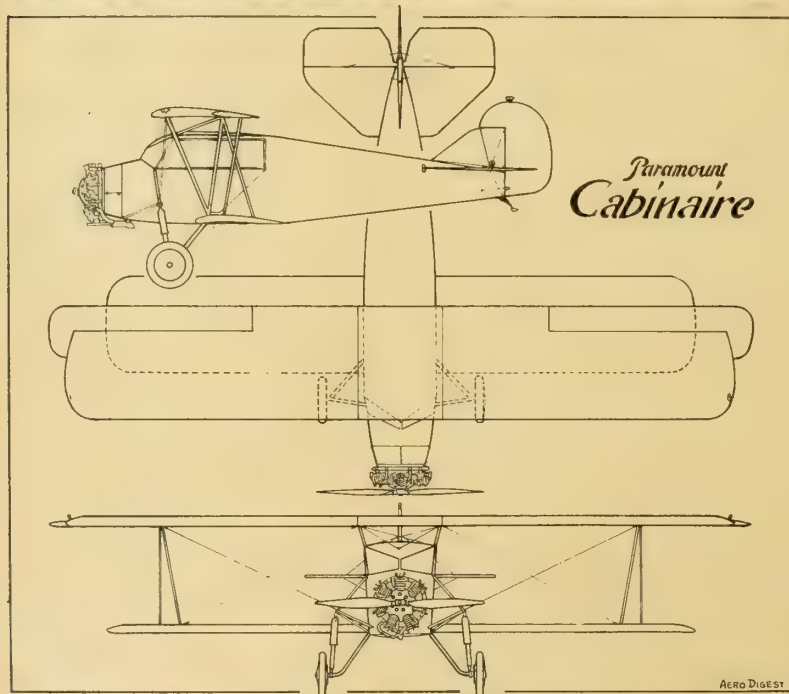
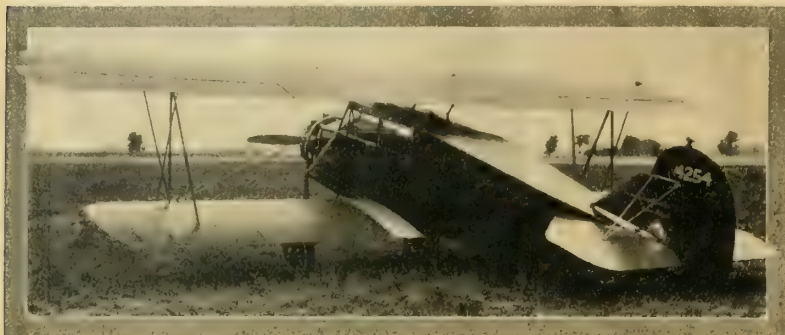
The interior of the cabin is clean in appearance, structural members being concealed. The upholstery is velour, the chairs are wicker and at the rear of the cabin there is a settee. All trim is finished either in mahogany or natural metal. The floor is covered by a rug. Windows along the sides are of Triplex glass; those in front are of non-shatterable plate glass. The window in front of the pilot is equipped with a wind-shield wiper.

## Specifications

Span, upper wing.....	34 feet 8 inches
Span, lower wing.....	29 feet
Wing area (including ailerons).....	322 square feet
Height.....	9 feet
Length.....	23 feet 9 inches
Wheel tread.....	7 feet 6 inches
Weight empty.....	1,300 pounds
Total weight loaded.....	2,208 pounds
Pay load.....	908 pounds
Gasoline capacity.....	42 gallons
Oil capacity.....	4 gallons

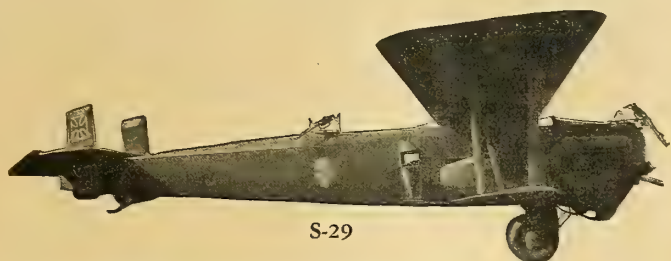
## Performance

High speed .....	103 miles per hour
Stalling speed.....	38 miles per hour
Cruising speed.....	90 miles per hour
Rate of climb.....	750 feet per minute
Service ceiling.....	12,000 feet
Cruising range.....	465 miles



The Paramount Cabinaire biplane powered with a 110 h.p. Warner engine.

# OVER HALF A MILLION MILES



S-29

— and  
**Still  
Flying!**

## A Remarkable Record

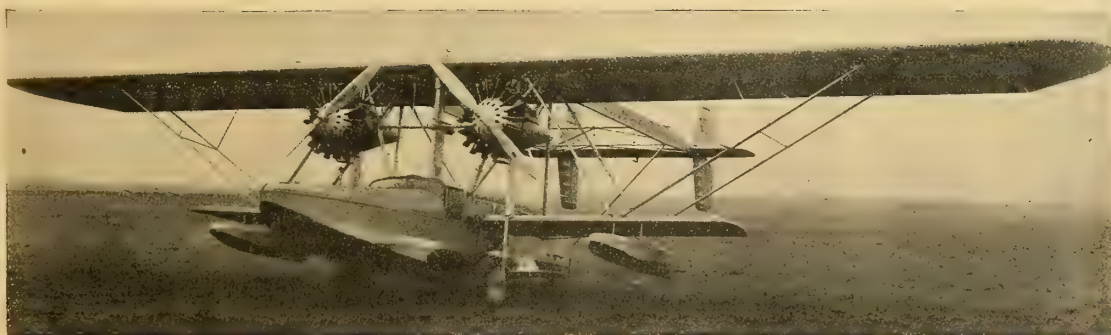
- 1924—S-29 was built and was the first large commercial transport plane in the United States.
- 1925—Carried two baby grand pianos and six passengers from New York to Washington, D. C.  
First successful radio broadcasting from the air made from this plane.  
Carried fourteen passengers from New York to Yorktown, Va. and return.
- 1926—Made advertising trips over most of the area east of Mississippi River. Voice amplification from air first accomplished from S-29.
- 1927—Traveled as first flying cigar store.
- 1928—Acting the part of a German bomber for the movies in California.
- 1929—Still flying for the movies.

**A**BOVE is shown the famous Sikorsky S-29, of fabric-covered all-metal Sikorsky construction, which was built in 1924. This remarkable plane has flown more than 500,000 miles in the last five years and is still in active service.

The latest product of Sikorsky—the Sikorsky Amphibion S-38, which is pictured below—is of similar, but improved Sikorsky construction.

There could be no more conclusive evidence of the amazing qualities of endurance which are built into the Sikorsky planes.

# SIKORSKY AMPHIBION



S-38

*Illustrated literature upon request*

## CURTISS FLYING SERVICE

INCORPORATED

GARDEN CITY ~ NEW YORK

SOLE SALES AGENT IN THE UNITED STATES



*Manufactured by the* SIKORSKY AVIATION CORPORATION, College Point, L. I., N. Y.





# FAIRCHILD 71 MONOPLANE

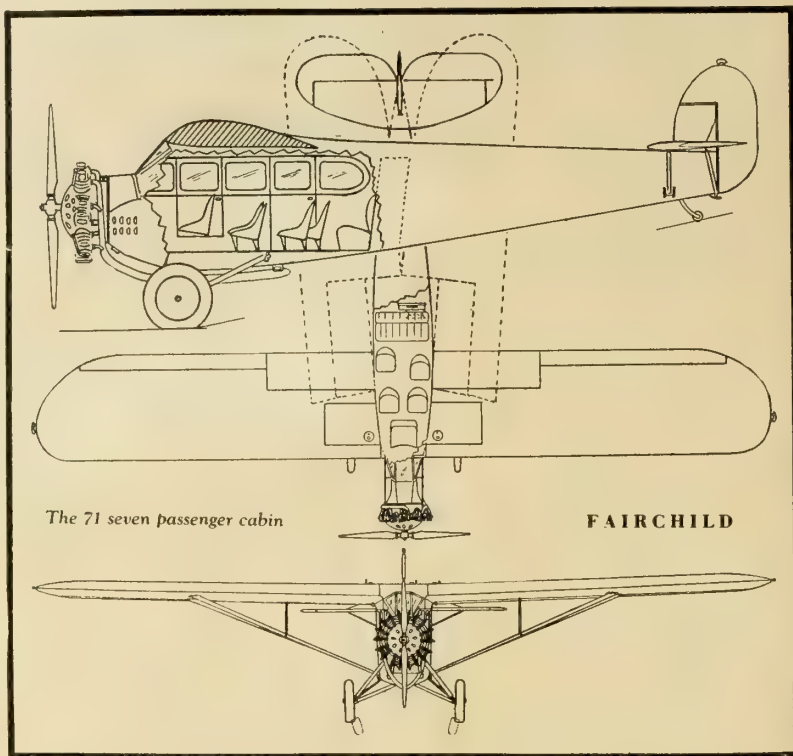
**T**HE Fairchild Model 71 is a seven-place commercial monoplane powered with a Pratt & Whitney Wasp engine. The outstanding features of the design are folding wings, comfortable, spacious cabin, ready attachment of seaplane, or photographic equipment, and the high speed of 138 miles per hour with a useful load of 2,700 pounds.

The wings are braced by two struts on either side and fold backwards about the rear spar. The wings are held in flying position by a lock which is visible to the pilot. The landing gear attaches directly to the side and bottom of the fuselage. The cabin seats seven—six passengers and the pilot. Behind the main cabin is a baggage compartment. The fuselage is made narrow at the pilot's seat, thus providing excellent vision on both sides.

Wing panels are constructed entirely of wood, with cloth covering. The spars are of the box type, comprising a top and bottom spruce member, each about 2 inches wide, connected together with bulkheads, and covered on both sides with 2-ply spruce planking. The spars are varnished within and without, and are glued together with casein glue. Wherever fittings attach, or bolts pierce the spar, the spar is reinforced.

The ribs are spruce, with 3-ply mahogany gussets. Compression ribs are made in the form of a heavy Warren truss. The drag wires are double, assuring an exceedingly rigid wing, free from torsion. The leading edge is covered with 3-ply mahogany, as far back as the front spar, and reinforced between the ribs. The ailerons, which are long and of small chord, are made entirely of welded steel tubing. Each aileron is carried on four self-aligning ball bearings. They are supported from the rear spar by duralumin brackets.

The wing struts are streamline steel tubes. They attach to the fuselage directly beneath the rear spar, and reach well out toward the tip. They are reinforced near the center by a truss of small streamline tubing, which connects them with the wings. The trailing edge of the wing, from the aileron to the fuselage, is made in the form of a flap, which is hinged to the top of the rear spar by four hinges, and is locked to the bottom of the spar by four locks, all operated by a master handle. The flap is built up of a transverse spruce beam, and ribs, covered with cloth.



The wings can be folded without the use of any tools, and when extended, are held in flying position by hinge pins which are locked in place for safety. To fold the wings, the flaps are first released by pulling down the master handle. Each flap is then folded upward till it rests on the upper surface of the wings. A jury strut is slipped into place, which supports the leading edge of the wing in the folded position. The wing locks are then unlocked. These are in reality ordinary padlocks, and are used in preference to any other type because the pilot can see them and make sure that they are in position. They release a lever at the side of the fuselage. Pulling back on this lever withdraws the front hinge pin, and allows the wing to fold backwards until it is parallel with the fuselage, where it is secured. To extend the wings, the procedure is reversed.

The landing gear is of the split axle type. The axles are attached to the bottom of the fuselage in the center. The shock ab-

sorber struts attach to the side of the fuselage beneath the seat for the pilot. A heavy cross tube at this point takes the compressive load from the struts. The drag strut extends backward from the wheel hub and joins the fuselage at the point of attachment of the wing struts. Bendix disc/wheels and brakes are standard equipment.

The tail skid is unusual in that it incorporates the principles of both tail skid and tail wheel. The skid itself terminates in a very broad steel shoe, which carries a small steel wheel. In soft fields or deep mud the shoe carries the load. On concrete ramps, or in the hangar, the load is carried on the wheel. The whole unit is full-swiveling, and supported by a frame inside the fuselage, which moves upwards and backwards under load. The shock is absorbed by rubber blocks in compression.

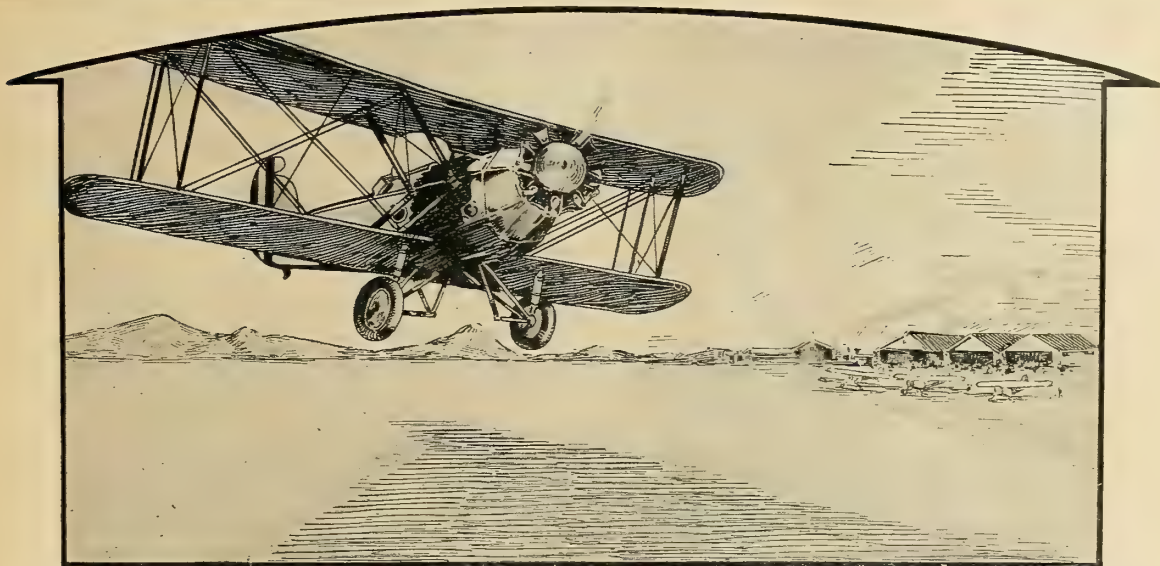
Tail surfaces are constructed entirely of welded steel tubing. The rudder and elevators are balanced. The fin is adjustable on the ground, and is braced to the stabilizer by streamline wires. The stabilizer is adjustable in flight. The leading edge of the stabilizer is moved up and down by a left and right screw adjustment to which it is attached. The rear spar of the stabilizer is braced to the fuselage by steel streamline struts at the tail post. The front spar is similarly braced, but in this case the struts are attached to a sliding frame inside the fuselage, which is in turn supported and actuated by the stabilizer adjustment screw.

The fuselage is constructed entirely of welded steel tubing. In all highly stressed



Side view of the Fairchild 71 seven passenger folding wing monoplane

(Continued on next page)

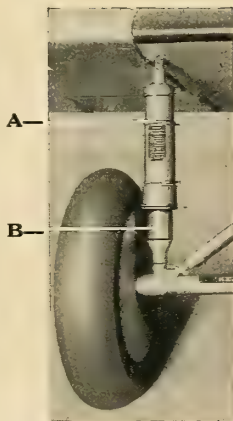


## AEROL STRUTS HAVE CONTRIBUTED TO MARTIN ACHIEVEMENT—

**M**ANY factors enter into the remarkable performance of the Martin "74". No small portion of its far-famed ability in taking-off and landing is attributed to its being equipped with Aerol Oleo-Pneumatic Struts.

Capable of absorbing, without recoil, a landing impact equal to several times the weight of the loaded plane, these struts not only protect the ship from destructive shock but make practical the carrying of maximum pay loads.

The unequaled smoothness of taxiing, and firm yet resilient action of Aerol Struts, enable the Martin "74" to take-off under full load with astonishing ease.



This view shows how Aerol Struts are installed between the fusilage and wheels. "A" is the stationary cylinder. "B" is the sliding piston attached to the axle allowing perfect freedom of movement, yet effectively eliminating destructive shock before it reaches the fusilage.

Last but not least is the factor of landing-safety that is contributed by Aerol Struts. Ask any pilot, who has made a forced landing, how good it is to realize that a pair of Aerol Struts are between him and the ground.

The Great Lakes Aircraft Corp'n, makers of the Martin "74", now standardizing on this equipment, are offering the industry the utmost in protection to ship and structural maintenance.

Aerol Struts are produced by The Cleveland Pneumatic Tool Company, Cleveland, Ohio.

*Ask the Pilots Who Land on Them*

# AEROL shock absorbing STRUT



(Continued from preceding page)

members, chrome molybdenum steel is used. All wing and chassis attachment points are jugged for interchangeability. The fittings to which the wing struts attach are heat-treated steel forgings of large dimensions. These two forgings, one on either side of the fuselage, are connected by two steel tie rods, passing through the bottom of the fuselage, to take the tension of the wing struts.

Elevator and rudder control cables are guided by large bakelite pulleys under the pilot's seat and are carried under the cabin floor to the rear of the baggage compartment where they have a direct run to the control horns without the necessity for a jack-shaft. Aileron cables take off vertically on either side of the pilot, extending to the top of the cabin where they pass back to the rear spar. At this point they attach to a lever on either side of the fuselage. Mating with each lever is a corresponding lever in the wing, to which is attached the cable running out to the aileron. When the wings are folded, these two levers are separated, and have no common connection. As the wings are swung into flying position, the levers mate into one another and form a common unit.

At the pilot's left is the stabilizer adjustment handwheel. This is attached to a drum which connects by cable under the floor to a corresponding drum on the screw adjustment at the stabilizer.

The instrument board, directly in front of the pilot, carries the ignition switch, gasoline cock, primer, starter button, and light switches, in addition to the following standard instruments: compass, air speed indicator, turn and bank indicator, altimeter, tachometer, oil thermometer, oil pressure gauge.

There is ample space on the board for an earth inductor compass, or any other instruments the owner cares to add.

The compass is carried on the ceiling, just back of the pilot, and is read by means of a small mirror on the instrument board. Placing the compass in this position prevents the engine magnetos from affecting the compass. The lettering on the compass is re-

versed, so that it reads correctly in the mirror.

A Hamilton duralumin propeller is standard equipment, together with an Eclipse hand-inertia starter, a booster magneto, a primer, and a carburetor intake heater. The Hamilton propeller is of the adjustable blade type without spinner.

Oil is carried in two tanks, one on either side of the motor, totaling 15 gallons capacity. The cowl over these tanks is lined with heavy felt to keep them warm in cold weather, but may be removed entirely in hot weather, thereby leaving the surface of the tanks exposed to the slipstream. At the front of the engine is a large circular cowl with openings which may be regulated from the cockpit sufficiently to control the temperature of the engine. The remainder of the cowl is quickly detachable.

The exhaust manifold consists of a pair of semi-circular collector rings, gathered into a common tail pipe at the bottom. The collector rings are made in segments, with slip joints to provide for expansion. At the bottom, the common exhaust passes through a combined heater and silencer unit, which not only reduces the exhaust noise, but provides the cabin with heat through two floor radiators, which are independently controlled in the cabin.

The gasoline is carried by a 60-gallon tank in each wing and a 40-gallon tank above the cabin—160 gallons in all. The gasoline flows by gravity to a selective valve on the instrument board, and thence to a strainer and water trap. Here it is picked up by an engine-driven fuel pump, and delivered under pressure to the carburetor. The excess from the pump is by-passed back into the line.

The two 60-gallon tanks fold with the wings. Gasoline is led from the rear inner corner of these tanks to the fuselage through a "Titeflex" flexible metal hose. When the wing folds, the hose simply bends; it need not be disconnected.

The cabin is entered by two doors on the right-hand side. The front door is for the pilot. There are four individual metal seats, and a continuous double seat across the rear of the cabin. All seats are upholstered with

deep Marshall spring cushions, and equipped with safety belts. The sides and roof of the cabin are upholstered in leather, backed by a thick layer of kapok soundproofing. The floor is covered with carpet. The windows are of non-shatterable three-ply glass. The trim is walnut.

The baggage compartment is entered from a separate door on the outside. Additional space for small articles is provided under the rear cabin seat.

The design of Model 71 makes it particularly adaptable for use on floats. The floats are 22 feet 8 inches long, are spaced 10 feet 6 inches on centers, and have a gross displacement of 10,750 pounds which is nearly double the gross weight of the plane. The floats are attached to the bottom of the fuselage by means of a front and a rear cross truss, interconnected with steel cables. In addition, a strut runs from the top of the fuselage to near the front of each float. This makes an exceedingly rigid float gear, free from weaving or deflection in rough water. The floats themselves are metal covered and contain 12 water-tight compartments.

#### Specifications

Span .....	50 feet
Length (landplane).....	33 feet
Length (seaplane).....	37 feet
Height (landplane).....	9½ feet
Height (seaplane).....	11½ feet
Wing area .....	332 square feet
Aileron area .....	34 square feet
Elevator area .....	24½ square feet
Rudder area .....	11 square feet
Fin area .....	4 square feet
Stabilizer area .....	30 square feet

#### Weights and Performance

	Landplane	Seaplane
Weight, empty.....	2,785 lbs.	3,135 lbs.
Disposable load.....	2,715 lbs.	2,365 lbs.
Gross weight .....	5,500 lbs.	5,500 lbs.
High speed.....	138 m.p.h.	128 m.p.h.
Landing speed.....	55 m.p.h.	55 m.p.h.
Cruising speed.....	110 m.p.h.	102 m.p.h.
Service ceiling.....	17,500 feet	17,000 feet
Initial climb.....	1,050 ft./min.	900 ft./min.
Climb in 10 minutes.....	7,000 feet	6,500 feet
Cruising range .....	900 miles	850 miles

## JORR PROCESS CASTOR OIL LUBRICANT

By JOHN T. OWEN, Research Engineer, Airway Oil Companies

**A**LUBRICATING film is composed of many layers. These layers must slide by one another without cohering; otherwise, high fluid friction or internal friction within the lubricant itself will result. High adhesion to metallic surfaces is necessary in order to prevent film ruptures. In oils made from straight petroleum hydrocarbons, the above features are maintained partially by careful refining, so that the colloidal structure of the lubricant is not destroyed or made unstable.

In determining the lubricating value of oil, too much stress is usually brought to bear on physical specifications. Tests for gravity, viscosity, flash, fire, cold test, color, etc., have no bearing on lubricating values, but are only control tests which enable the

refiner or compounder to make uniform products. To date, no general test has been adopted by which lubricating value can be determined. Some research work has been done on the isolation of the colloidal hydrocarbons. This work has proved that the colloids are the heart of a lubricant, and the amount of colloids contained within a lubricant governs its efficiency.

Although castor oil will not mix with petroleum lubricating oils, it makes a good lubricant when used straight. The absorbent values of castor oil make possible strong adhesion between the outer layers of the film and low cohesion between the inner layers. The albuminous and mucilaginous constituents in castor oil, however, cause considerable gumming, and the aldehydes cause

redolent odors from the exhaust. There are on the market some so-called miscible castor oils, which are made either by blowing the castor oil or by using a third agent, such as rape seed, lard or other animal or vegetable oils. These castor oils will mix for a short time with lubricating oils made from petroleum hydrocarbons, but will eventually separate. Furthermore, the gumming has not been eliminated, nor have the strong odors been taken out.

Under the Jorr Process all of these inimical properties have been removed from castor oil. Therefore, it is possible to incorporate this castor oil with any petroleum lubricating oil. The dangers of gumming and separating have been eliminated entirely, proving the value of the process.



## Alundum Crystolon

These electric furnace abrasives serve industry not only in Norton Grinding Wheels—major tools of production—but also in Norton Refractories, Laboratory Ware, Porous Plates, and Norton Floors (non-slip).

NORTON COMPANY WORCESTER, MASS.

# NORTON

Grinding Wheels  
Grinding Machines



Refractories-Floor  
and Stair Tiles



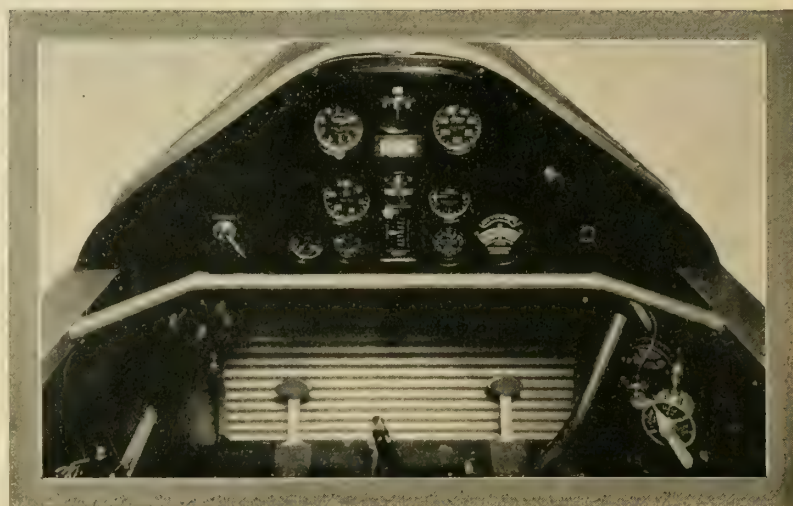
# STEARMAN SPEED MAIL PLANE

By  
J. E. Schaefer  
Stearman Aircraft Co.

**T**HE Varney Air Lines, operating a feeder line from the Transcontinental to the Northwest, has been using Stearman equipment powered with J-4 Whirlwinds. Since this line, however, traversing the rugged country between Salt Lake City, Utah, and Pasco, Washington, had grown to large proportions, the Varney company was forced to seek larger equipment. The service had to be extended to Portland, Oregon, with feeder service to Seattle. Night flying schedules were soon to be inaugurated. The company was faced with the necessity of providing new equipment to meet these conditions. Mr. Varney presented his problem to Lloyd Stearman, president of the Stearman Aircraft Company, and Mac Short, vice president in charge of engineering. The outcome of this conference was the Stearman Speed Mail, which was completed and tested January 15, 1929.

Five of these Wright Cyclone powered super mail planes are to replace the present Whirlwind powered equipment which is to be transferred to the Pasco-Spokane line when proper authority is obtained. The Stearman Speed Mail adds further credit to its designer, Lloyd Stearman, and its engineer, Mac Short.

Only the results of the preliminary flight test are available at the time this copy goes to press. It was anticipated by those at the Stearman factory that the Speed Mail would have a top speed of 150 miles per hour, a cruising speed of 120 miles per hour and a landing speed of 55 miles per hour. The tests completed thus far prove these figures conservative. An indicated air speed of 150 miles per hour at 1,800 r.p.m. has been easily maintained. It is expected that a degree change in the propeller setting will admit 1,950 r.p.m. of which the engine is capable. Greater speed should be obtained by thus making available the full 525 h.p. of the engine. The landing speed fell below that



Instrument board and cockpit arrangement, Stearman mail plane.

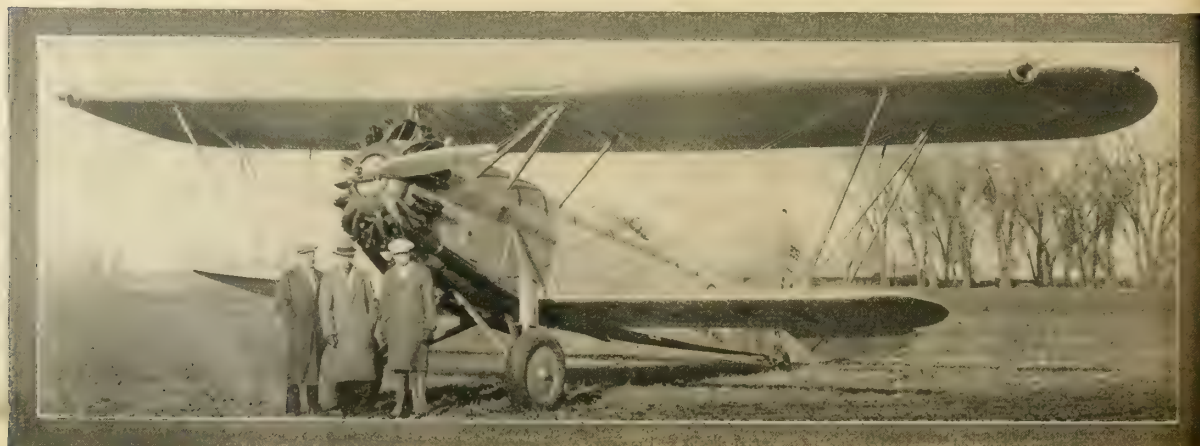
anticipated by as much as ten miles per hour, according to preliminary estimates.

Pilots and operators over the country have made suggestions, and these have been incorporated into the design. The pilot's cockpit has been designed with an idea of insuring his comfort and protecting him under all operating conditions. The instruments are so arranged and grouped that he may quickly and easily follow the operation of the engine or the course of the ship. The panel is indirectly lighted, the lighting being controlled by rheostats so that the intensity may be suited to the pilot's particular needs. No light switches are located on the instrument panel. These are located on a switch board, conveniently placed at the pilot's right hand so that he may easily control every circuit in the ship. All wiring is shielded and is in conduit. Over 500 feet of wire is used to control and operate the landing lights, navigation lights, cockpit lights, motor lights, dash lights and instrument heaters. Inspection of this wiring and all fuel lines is easily made by removing the side cowl.

The pilot's cockpit is provided with a heater, and the seat and controls are all adjustable so as to make them adaptable to the tall and short pilot. Bendix brakes are used. Their application is provided in a convenient manner through a system of simple leverage. The rudder pedals are pivoted so that pressure on the top of the pedal operates the brakes.

Fire hazard is reduced to a minimum. A Phister Ace pressure fire extinguisher is located in the pilot's cockpit ready for any emergency. Nozzles are located at convenient points about the motor. Protection for the conditions imposed at both ends of the thermometer is provided, for in addition to fire protection, an ice warning indicator is installed to warn the pilot of impending danger due to ice forming on the wing panels.

The general construction follows the bi-plane principle as modified to suit the conventional sesqui design. The span of the upper wing is 46 feet and the lower 32 feet. The total wing area is 436 square feet.



The 525 h.p. Stearman Speed Mail plane. Left to right, J. E. Schaefer, Lloyd Stearman and Mac Short.

Stearman

SPEED MAIL

U.S.

MAIL



PERFORMANCE DATA  
THE STEARMAN SPEED MAIL

Maximum speed, sea level	150 miles per hour
Cruising speed	120 miles per hour
Landing speed	55 miles per hour
Rate of climb, sea level	1400 feet per minute
Service Ceiling	1800 feet
Note: The above performance is anticipated and conservative. Preliminary flight tests made January 15th indicate its correctness with respect to conservative limits. Final flight test data will be furnished anyone interested upon written request.	

WEIGHT DATA

Weight light	3360 pounds
Pay load	1000 pounds
Pilot	170 pounds
Fuel (140 gallons)	810 pounds
Oil (15 gallons)	120 pounds
Gross weight	5460 pounds
Mail and express cargo space	91 cubic feet

AERODYNAMIC DATA

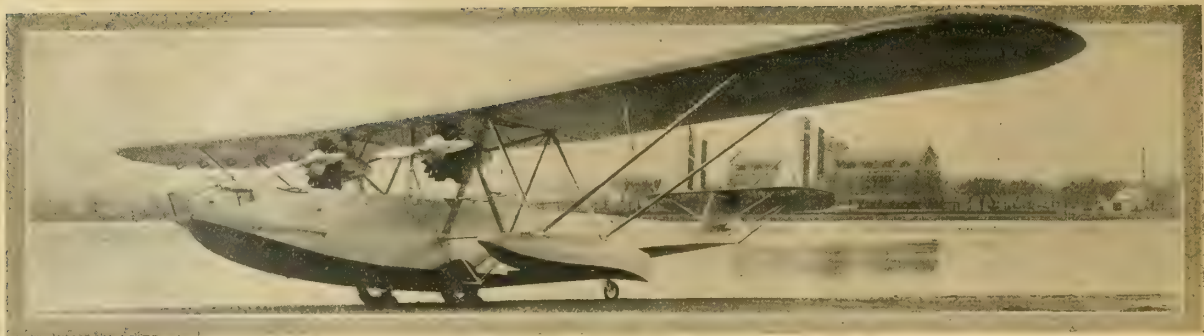
Span, upper wing	46 feet
Span, lower wing	32 feet
Overall length	36 feet
Height	12 feet
Power loading	10.4 pounds per H.P.
Wing loading	12.5 pounds per square foot
Power Plant	Wright Cyclone

THE Stearman Speed Mail adds another beautiful and practical model to the Stearman line. Six contract mail operators in the United States and one in Canada have found the Whirlwind powered (225 H.P.) C-3MB model profitable and efficient. The Cyclone powered (525 H.P.) Speed Mail bids well to take its place in the forefront of modern commercial design. Write for further particulars.

The STEARMAN AIRCRAFT COMPANY

WICHITA KANSAS





## CONSOLIDATED XPY-1 PATROL BOAT

AS a result of a design competition open to the American industry, the Navy awarded the contract for XPY-1 Navy Patrol Boat to the Consolidated Aircraft Corporation. Actual construction commenced in January, 1928. The boat was completed and entirely assembled in the large Elmwood Avenue Plant No. 2, Buffalo, N. Y., in December, 1928. It was then disassembled, racked on three large flat cars and shipped by rail to the Navy Yard, Washington, D. C.

Arriving there on December 26, it was partially assembled, swung into Anacostia River by a huge locomotive crane, towed across to the Naval Air Station, Anacostia, D. C., and there completely assembled by January 10, 1929. Its demonstration flights were conducted by Consolidated Aircraft Corporation on that day and the next day, during the course of which it was demonstrated to the Navy's satisfaction that it exceeded all requirements.

With comparatively few changes, this boat is readily converted into a commercial transport. As a commercial craft, it incorporates provision for the seating of 32 persons comfortably, and includes the necessary baggage, toilet and radio compartments.

The Navy in fostering this project, has aided in providing an ideal commercial transport to fill the need existent in the United States today.

The XPY-1 in its preliminary flights indicated a high speed of approximately 120 m.p.h. With full military load, it took off in about 30 seconds and climbed more than 5000 feet in 10 minutes. Its service ceiling apparently will be almost 12,000 feet.

The hull lines were laid down by Captain H. C. Richardson of the Bureau of Aeronautics, one of the world's leading authorities on flying boat hulls. First flights show that the XPY-1 hull is more efficient than anything yet constructed. It is constructed of 17-ST shapes arranged in trusses and floor frames, covered by dural plating and is divided into a series of water-tight compartments by means of bulkheads provided with water-tight doors and covers. Lateral stability on the water is provided by two outboard floats located about 14 feet on each side of the hull center line. The flotation system is tied into the wing bracing so that while the overall span is large, the overhang at the wing tips is less than  $1\frac{1}{2}$  chord lengths.

The wings and tail surfaces consist of

extruded 17-ST spars, drag trusses and sheet dural ribs, fabric covered. The wings are monoplane, externally braced and include a center section and 2 outboard panels. Their span is 100 feet, chord  $11\frac{1}{2}$  feet and aspect ratio 9. The airfoil used is the Goettingen 398 which affords the happy combination of maximum  $l/d$  and proper spar depth for large span. The ailerons are of the balanced type, easy in operation through a wheel control and quite effective in lateral control.

The tail surfaces afford ample stability, directional and vertical control through the use of an externally braced monoplane stabilizer, single unbalanced elevator, and twin fins and balanced rudders above the stabilizer and elevator.

The motive power of the XPY-1 is supplied by two Pratt & Whitney geared Wasp engines, driving two 2-bladed adjustable pitch propellers, 10 feet 6 inches diameter, carried in nacelles located underneath the wing. The main fuel supply is contained in large tanks in the hull, from which it is pumped to gravity tanks located in the leading edge of the center section, near each engine. Oil is carried in tanks located in the center section over each engine nacelle. The center section structure is designed to take a third engine located on the longitudinal center line above the wing. If the boat were converted to commercial work, 3 engines would be installed to increase the power plant margin of safety. Flight tests showed that the propellers are clear of the spray thrown in planing prior to take-off. Incidentally, the hull lines are such that a remarkably small amount of spray is thrown, its planing being markedly clear. With 3 geared Wasps installed, the high speed of the Consolidated Patrol Boat is expected to surpass 135 m.p.h.

### GENERAL DATA

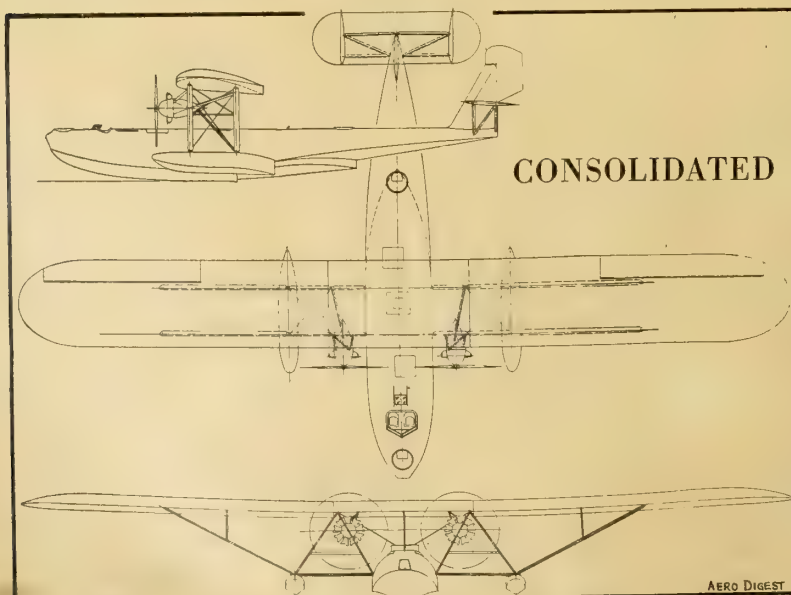
#### Dimensions

Span .....	100 feet
Chord .....	11 feet 6 inches
Overall length .....	62 feet
Overall height .....	15 feet

#### Areas

Total wing, including ailerons	1,110 square feet
Stabilizer .....	81 square feet
Elevator .....	$54\frac{1}{2}$ square feet
Fins (two) .....	25 square feet

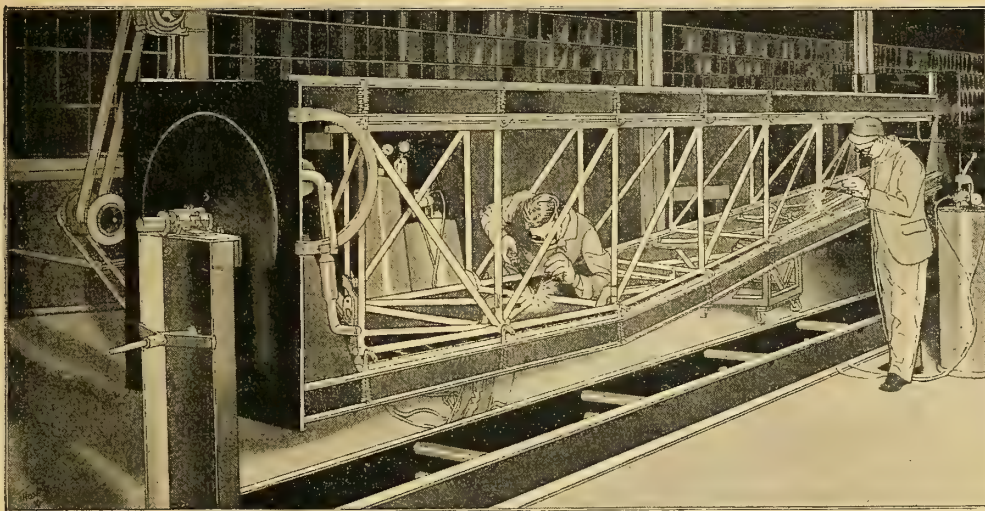
(Continued on next page.)



Outline drawings of the twin-motored Consolidated XPY-1 patrol boat

# STABILITY

*proved in the making....*



The Command-aire Fuselage Jig—an advanced manufacturing device patented by Command-aire's chief engineer. By means of this jig—used only by Command-aire—all fuselages, controls and parts are standard and interchangeable.

**C**OMMAND-AIRE stability begins in the beginning. It is literally in-built. Under the personal supervision of one of Germany's foremost aeroplane engineers, each exacting detail of his exclusive design is rigidly followed by COMMAND-AIRE master craftsmen.

Rigid standards for parts and fuselage design are maintained without variation through employment of the Fuselage Jig—an advanced manufacturing device patented by COMMAND-AIRE's chief engineer. By means of this Jig—used only by COMMAND-AIRE—all fuselages, controls and parts are standard and interchangeable.

## 10 Cardinal Superiorities of Command-aire Construction

- 1—Elevators and ailerons are tube controlled—positive—dependable.
- 2—Motor mounted on hardwood strip instead of direct to tubing.
- 3—Seat built integral with frame, adding rigidity.
- 4—Aluminum turtle back is removable, giving direct access to fuselage.
- 5—Wing panels have an extra bay providing extreme torsion strength.
- 6—Form ribs are selected spruce. Caps, top and bottom, reinforced with gusset plates of ply-wood.



- 7—All steel, metal floor—no wood except fairings.
- 8—Extra heavy landing gear.
- 9—Indirect instrumental lighting. Navigation lights standard equipment.
- 10—Built under authority of Department of Commerce Approved Type Certificate No. 53.

Every demonstration of COMMAND-AIRE's integral stability makes a new convert to COMMAND-AIRE preference. The ship thrives on comparison and wins on performance. The plane of widest sales is the plane of greatest stability—and that's COMMAND-AIRE. A single demonstration will convince you. Shall we arrange it?

COMMAND-AIRE, INC.  
Little Rock, Arkansas

# COMMAND-AIRE



THE PLANE FOR WIDER SALES

Say you saw it in AERO DIGEST



(Continued from preceding page)

Rudders (two) ..... 46 square feet

**Weights**

Weight empty ..... 8,240 pounds

Normal gross weight ..... 13,500 pounds

Overload gross weight ..... 16,000 pounds

**Loadings**

Wing loading (normal)

12 pounds per square foot

Wing loading (overload)

14.4 pounds per square foot

Power loading (overload-2 engines)

15.3 pounds per h.p.

Power loading (overload-2 engines)

18.2 pounds per h.p.



Side view of the twin-motored Consolidated patrol flying boat, type XPY-1

## MAXIMUM SAFETY CABIN PLANE

**T**HE Maximum Safety cabin plane is produced by the Maximum Safety Airplane Company of Los Angeles, Calif. This ship, a two-place monoplane, was designed to provide safety with a low landing speed and low flying speed. The minimum flying speed with positive control, the manufacturers claim, is 39 m.p.h.

The wings are of box spar cantilever construction, but have flying struts in addition thereto. The combined dihedral angle of the wings is unusually great—14 degrees.

The fuselage is of conventional design, being of steel tube construction. The interior of the cabin is upholstered with gray leather. The two seats are placed side by side, with dual control. A complete set of instruments is standard equipment. In the fuselage to the rear of the cabin, there is a large compartment for freight.

The landing gear is of the split axle type and has a 10-foot tread. Air and oil shock absorbers are provided for smooth taxiing and landing. Bendix wheels and brakes are standard equipment. The tail skid is provided with a Micarta wheel.

**Specifications**

Wing span ..... 36 feet

Chord (maximum) ..... 11 feet  
Chord (minimum) ..... 6 feet  
Length overall ..... 34 feet 1 inch  
Height overall ..... 9 feet 4½ inches  
Weight empty ..... 1,630 pounds  
Stalling speed ..... 25 miles per hour  
Landing speed ..... 19 miles per hour  
Climb to 1,000 feet ..... 98 seconds

## CONTINENTAL AERO ENGINE

**C**ONTINENTAL MOTOR CORPORATION of Detroit exhibited its new air-cooled aviation engine at the Automobile Show in New York last month. This engine is a 7-cylinder radial designated by the company as model A-70. At 1500 revolutions per minute the output is computed as 150 horsepower. Its weight without starter is about 375 pounds. The bore is 4½ inches and the stroke is also 4½ inches.

Engineering work on the model A-70 is under the direction of Mr. Robert Insley, former assistant chief of the Power Plant Division, U. S. Army Air Corps, McCook Field.

The engine is of unusually clean appearance, all accessories having been built in or placed in the rear. The arrangement of the engine is such, however, that all parts are readily accessible. Although it is generally unusual for a first model, this engine appears to lend itself well to standardized production.

The cylinders are of the steel barrel type with Bohnalite cast heads screwed and shrunk on. The head and rocker arm boxes are integral. The valve rockers are mounted on ball bearings and the valve gear inclosed.

The chrome nickel steel crankshaft is of the two-piece type with an integral master rod.

The crankcase of heat-treated aluminum is in 3 pieces; the rear section housing the gear case is removable with all gears intact. All journals are forged with the gears, eliminating splines and keys. Gears are of chrome vanadium steel.

In the oiling system two pumps are used, one for pressure and the other for scavenging. There are no oil tubes in the system; all leads are drilled.

Two BG Hornet spark plugs are set in each cylinder, one forward and one nearly opposite. Two Scintilla magnetos are now used, but provision is made for fitting the new type Scintilla double distributor unit. An Eclipse starter is installed as optional equipment, and provision is made on the crankcase casting for mounting an electric generator. Holes are drilled in each cylinder so that the Heywood air starter may be used if desired. A Stromberg type NAR-5 carburetor is used.

The accessories are grouped in a compact unit which will pass through the mounting ring.

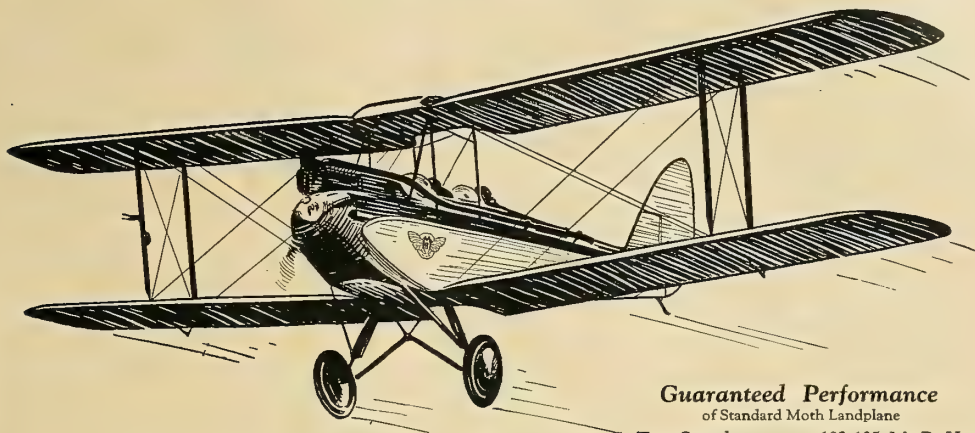
No detailed specifications of the engine are available at this time. Technical data will not be made public until after the engine has undergone the Department of Commerce tests. It is expected, however, that manufacturing will begin before April first. Special machinery has already been installed to facilitate production.

This newcomer in the aircraft engine field is to be exhibited at the New York Aviation Show at Grand Central Palace, this month, where its points of merit will be explained.



Maximum Safety cabin plane, which has a landing speed of 19 m.p.h.

"THE · BEST · LIGHT · AIRPLANE · IN · THE · WORLD ·"



**Guaranteed Performance**  
of Standard Moth Landplane

Top Speed . . . . .	103-105 M. P. H.
Cruising Speed . . . . .	85-90 M. P. H.
Stalling Speed . . . . .	41 M. P. H.
Rate of Climb . . . . .	700 feet min.
Ceiling . . . . .	18,000 feet

# Announcing American Production The D. H. GIPSY MOTH

THE D. H. GIPSY MOTH—"the light car of the air"—brings to American aviation a new and unique type of airplane which has achieved such remarkable popularity that it is now flown in every country in the civilized world.

It holds the important world's light airplane records for speed, altitude, and endurance, yet it is so safe, so easy to learn and handle, that it is the ideal plane for beginners and women flyers. It is as economical to run as an automobile and, because of its lightness and folding wings, it can be towed over an ordinary road and stored in a fair-sized garage.

The Moth plane and engine were designed by Captain de Havilland, acknowledged one

of the world's greatest aeronautical engineers. The de Havilland Gipsy Engine will be built by the Wright Aeronautical Corporation in the United States.

Exceptional Moth features include welded steel fuselage, combining unusual strength and lightness; *folding wings*, which permit passing through a 10-foot gateway; and the famous Handley-Page safety slotted wing (furnished as an extra), which aviation authorities agree is the greatest single contribution to safety in flying. The Moth is now the *only* American plane with slotted wings.

***In 4,000,000 miles of flying the Moth has an unequalled record for safety.***

Deliveries of American-built Gipsy Moth planes will soon be available. Send for booklet and complete details.

**To Prospective Moth Owners—**  
We suggest ordering *now*, as we expect our early production to be greatly oversold.



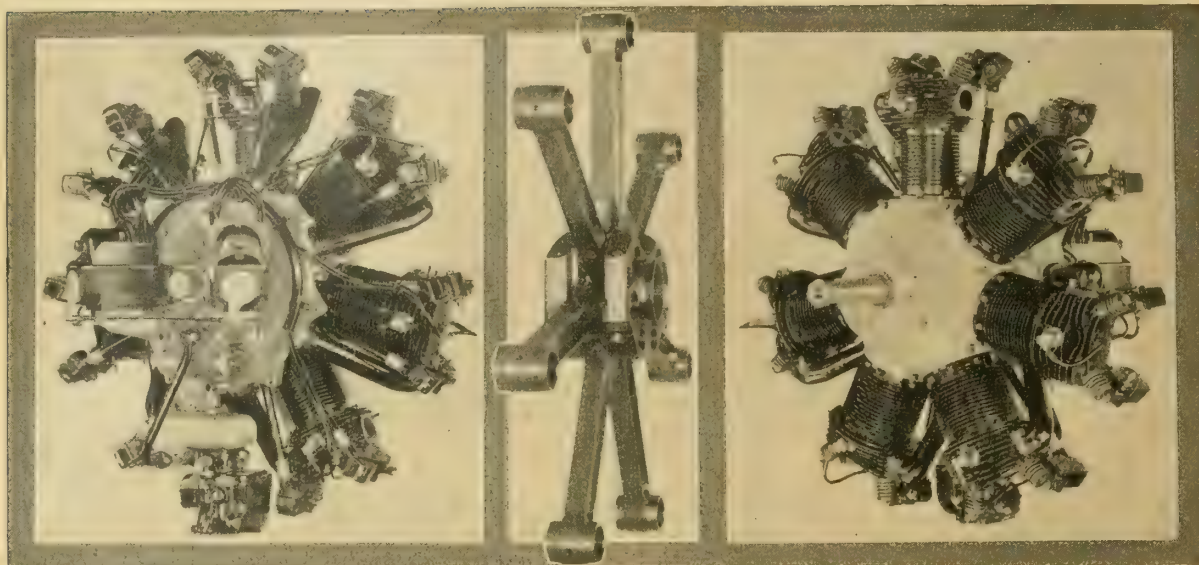
**To Dealers—**We are now ready to extend the Gipsy Moth franchise to responsible dealers, whose inquiries are solicited.

LICENSEE: THE DE HAVILLAND AIRCRAFT CO., LTD.

## MOTH AIRCRAFT CORPORATION

GRAYBAR BUILDING, NEW YORK . . . FACTORY, LOWELL, MASS.





Accessory end of the Warner engine

Piston rod assembly

Propeller end of the Warner engine

## WARNER SCARAB ENGINE

**I**N less than six months from the time the first Scarab engine was produced, the engine has proved itself in several competitive events.

The 1929 series Scarab, manufactured by the Warner Aircraft Corporation of Detroit, Michigan, retains all of the qualities of the original engine and has in addition a number of refinements and improvements which add to the performance and reliability.

### GENERAL SPECIFICATIONS

Rated power and speed...110 h.p. at 1850 r.p.m.  
Maximum power and speed...122 h.p. at 1950 r.p.m.  
Weight dry without hub or starter....270 pounds  
Specific weight.....2.45 pounds per h.p.  
Fuel consumption at rated power...55 lbs. per h.p. hr.  
Fuel consumption.....6 to 8 gallons per hour  
Oil consumption at rated power...0.25 lbs. per h.p. hr.  
Oil consumption when cruising...1 to 1.5 pints per hr.  
Bore .....4.25 inches  
Stroke .....4.25 inches  
Displacement.....422 cubic inches  
Compression ratio.....5.2 to 1  
Propeller drive.....Direct, clockwise  
Overall diameter.....35½ inches  
Overall length without starter.....29 inches  
Diameter of mounting ring circle.....17 inches  
Carburetor .....Single Stromberg  
Starter.....Hand-electric or air

The crankcase is made up in two halves, which are joined on the cylinder centerline. Both halves are made from heat-treated aluminum alloy of high physical properties and are well ribbed, so as to obtain the greatest strength and stiffness from the least amount of metal. This construction also eliminates a number of foundry difficulties and facilitates to a great extent the assembly and disassembly of the crankshaft and connecting rods as a unit.

The cylinder assemblies are bolted to the crankcase by means of eight studs each. The cylinder barrel is made of alloy steel, machined all over and amply finned for adequate cooling. The cylinder head is made from a heat-treated aluminum alloy casting, permanently shrunk and bolted to the cylinder barrel. The valve guides and valve seats are shrunk into the head. There are two spark plugs fitted to each cylinder; one in front and the other in the rear. The rocker arm housings are separate castings

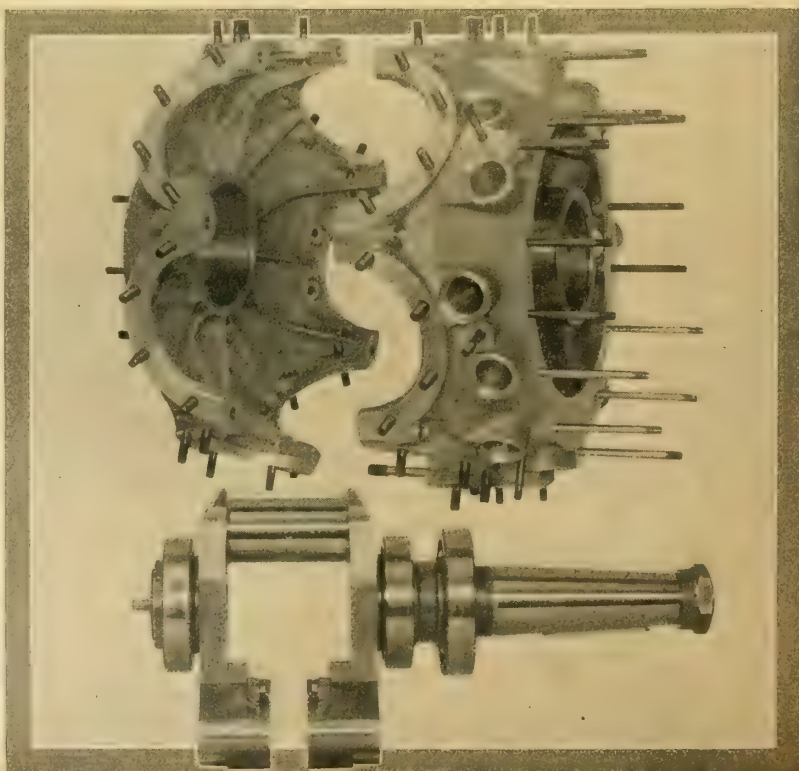
permanently attached to the cylinder heads.

All connecting rods are made of heat-treated alloy steel drop forgings. They are an I section, smoothly machined on all surfaces. The master rod is of a split type, 4-bolt design, with the babbitt at the big end spun centrifugally into the rod. Link rods are assembled to the master rod by means of wrist pins which are locked into the link rod and take their bearing in bronze


bushings, which are pressed into the master rod. Bronze bushings are pressed into the piston end of all rods for the floating type piston pin. Pistons are made of heat-treated permanent mold aluminum castings. Each is fitted with two compression and one oil scraping ring in addition to an oil collecting groove.

The crankshaft is made in one piece from

*(Continued on next page)*



Details of the Warner engine crankcase and crankshaft assembly



# Thompson Valves

## Original Equipment in 90% of American Built Aero Engines

Today, as America takes the lead in commercial aviation, Thompson Valves are standard in 90% of all American built aero engines.

The preference for Thompson Valves is not surprising. They have had a part in nearly every outstanding event of American aviation.

They have proven their greater reliability under con-

ditions which tried airplane valves to new and unheard of limits of endurance.

Thompson Research, that began in the earliest days of aviation, continues to keep pace with each new development of aero engines, contributing its part to the finer and more economical performance of the planes you build, sell or fly.

**THOMPSON PRODUCTS, INCORPORATED**

*General Offices: Cleveland, Ohio, U. S. A.*

*Factories: Cleveland and Detroit*





(Continued from preceding page)

an alloy steel drop forging, heat-treated to the highest physical qualities. The shaft is of the conventional one-throw design and machined all over. The crankpin is ground and lapped to exact dimensions. Bronze counter-weights are snugly fitted and bolted to the shaft. The shaft is supported in three ball bearings, and the propeller end is made to SAE specifications No. 1 for taper shafts, in order to enable standardization of propeller hubs.

The cam ring is made from a low carbon alloy steel drop forging, machined all over and case hardened on all wearing surfaces. The intake and exhaust cam surfaces are side by side with four cam lobes each. The cam ring revolves at one-eighth crankshaft speed. The driving gear is made integral with the cam ring, and the bearing on which the cam ring rotates is babbitt lined. The cam ring is driven from the auxiliary drive by means of a spur gear train and an idler shaft which also drives the oil pump.

The cam followers take their bearing in aluminum guides, chill cast in a permanent mold. The cam followers make contact with the cam by means of rollers, and have at the other end a spherical socket for the push rod. The push rods are made from duralumin with pressed on hardened and polished ball ends, and are fully enclosed in an aluminum tube. The upper ball end of the push rod fits into an adjustable socket in the rear of the rocker arm, which in turn acts on the valves by means of a roller. For protection the rear half of the rocker arm is enclosed, whereas the front half and the two telescoped valve springs are left open in order to receive the cooling effect of the air blast.

The induction system consists of a correctly proportioned annular passage in the

aluminum housing which supports the engine in the fuselage. The carburetor is attached to the lower part of this passage or ring, and separate intake pipes lead directly to each cylinder from the induction ring.

The engine is of the dry sump type. The oil is drawn from the oil tank by means of the pressure pump, which delivers the oil under pressure through a strainer to all plain bearings. The oil forced out of these bearings lubricates all other moving parts in

the engine. The oil collecting at the bottom of the crankcase is drawn from there by the scavenging pump and delivered back to the oil tank.

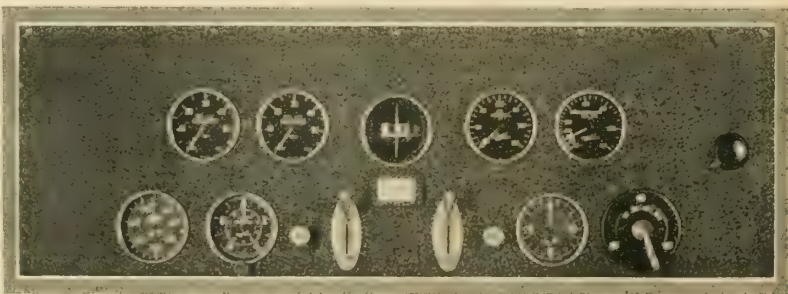
The gear case carries the two magneto drives and the magnetos, arranged so as to permit the mounting of a starter between them. In addition, it carries the oil pump, oil strainer, and oil pressure relief valve. It is made from a heat-treated aluminum casting.

## STANDARDIZED INSTRUMENT BOARD

EACH indicating instrument on the new standardized instrument board of the Consolidated Instrument Company of New York, is  $2\frac{3}{4}$ -inches diameter and encased in standardized crystals, the whole forming part of a new system of indirect lighting in which each instrument is a completely illuminated unit in itself. Because of the standardization in size, instruments are interchangeable on the board. Light diffusion is effected by a new patented process, while the light intensity is regulated by means of a hand rheostat, at the right of the board.

This new instrument board is also said to represent a distinct improvement from the standpoint of manufacturing costs, due to its standardization in size of panels and instruments, and the fact that a panel can be built, without additional cost, to contain as many or as few instruments as desired.

This standardization has made for greater compactness and lessened weight. In addition, the entire unit has been designed, not only for increased all-around efficiency and ease in reading, but also to add to the beauty of the modern airplane.



New standardized instrument board of the Consolidated Instrument Company

## Method of Seizing Wire Rope

THE following information, adopted from U. S. Government Master Specifications for Wire Rope (See Circular No. 208 of The Bureau of Standards) is reproduced from a pamphlet issued by the Macwhyte Company, Kenosha, Wis., manufacturers of wire, wire rope and wire products.

Before cutting a wire rope, seizings should be placed on each side of the place where the rope is to be cut, to prevent unlaying of the

strands. There should be three seizings on each side, applied as follows:

(1) Wind the seizing wire on the rope by hand, keeping the coils together and considerable tension on the wire.

(2) Twist the ends of the wire together counter-clockwise by hand, so that the twisted portion of wires is near the middle of seizing.

(3) Using "Carew" cutters, tighten the twist just enough to take up the slack. Do not try to tighten the seizing by twisting.

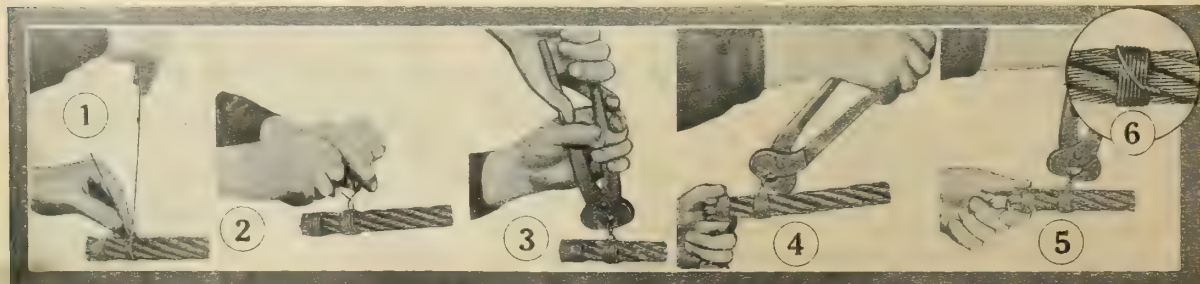
(4) Tighten the seizing by prying the twist away from the axis of the rope with the cutters.

(5) Tighten the twist again as in 3. Repeat 4 and 5 as often as is necessary to make the seizing tight. Cut off the ends of the wires and pound the twist flat against the rope.

(6) The appearance of the finished seizing is shown in figure 6.

Any annealed, low carbon steel wire may be used for seizings. It should be about the size given in following table:

Wire Rope diam. in inches	Seizing Wire diam. in inches
$\frac{1}{4}$ to $\frac{3}{8}$ .....	.054
1 to $1\frac{1}{2}$ .....	.105
$1\frac{3}{4}$ to $3\frac{1}{4}$ .....	.135



Illustrations showing the method of seizing wire ropes to prevent unlaying of the strands when cutting.

# THE HASLER TELMOT FLIGHT-O-METER

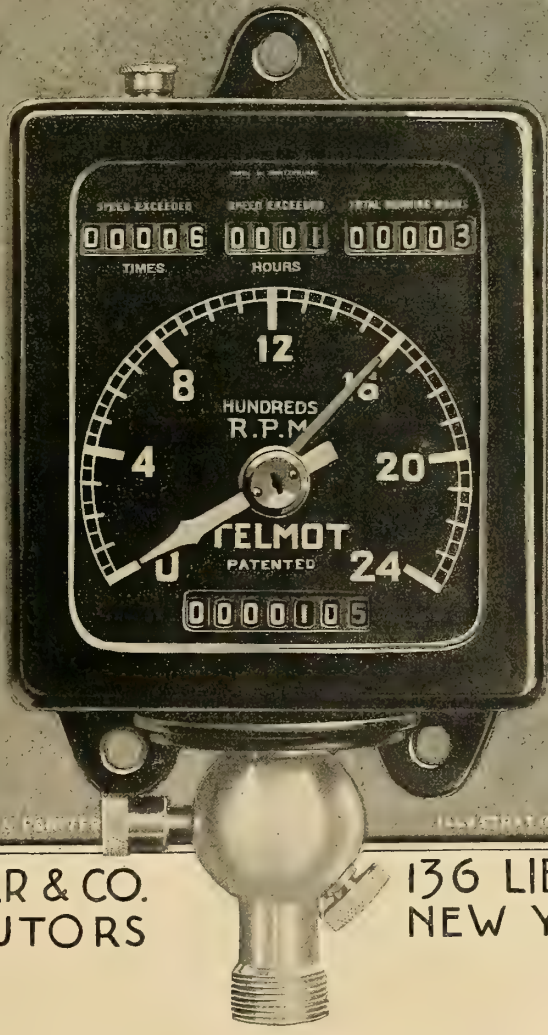
REGISTERS AND TOTALIZES  
DAILY  
WEEKLY  
MONTHLY  
YEARLY

- 1. ELAPSED ENGINE HOURS
- 2. ELAPSED ENGINE REVS
- 3. MAX. ENGINE SPEED
- 4. ENGINE AIR MILES
- 5. HOW OFTEN ENGINE WAS OVERSPEEDED
- 6. HOW LONG ENGINE WAS OVERSPEEDED

PERMANENT  
CALIBRATION  
GUARANTEED  
ACCURACY

FINEST  
AIRCRAFT  
TACHOMETER  
MADE ...

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# AMERICAN EAGLE MODELS for 1929

**T**HE AMERICAN EAGLE AIRCRAFT CORPORATION of Kansas City, Missouri, is producing during 1929, four different types of airplanes. Three of these ships are described below; the other is the Model A-229, a two-place biplane for training purposes, powered with a 90 horsepower OX-5 engine.

## Model A-329

The Model A-329 is a three-passenger full cantilever cabin monoplane. This ship is powered with the Curtiss OX-5, 90 h.p.; Warner Scarab 110 h.p.; Wright J-6 Jr. 150 h.p.; Curtiss Challenger 170 h.p.; or Wright 200 h.p. engine.

Fuselage, undercarriage, engine mount and tail group are constructed entirely of seamless steel tubing. There is no wire or rod type trussing in the fuselage structure. Passenger and baggage compartments are built integral with the fuselage. All joints, gussets and fittings are acetylene welded. All exposed metal parts are cadmium plated.

The interior of the cabin is finished in mohair to harmonize with the exterior finish. Seats are roomy and comfortable, and there is plenty of headroom. Triplex non-shatterable glass windows above, below

and to either side of the pilot provide good vision. Glass in the windows may be adjusted for ventilation by means of auto type crank lifts. Lighted instrument panel includes tachometer, oil pressure gauge, oil temperature gauge, compass, air speed indicator, turn and bank indicator, altimeter, switch and primer. All controls are entirely enclosed.

Landing gear is of the high split axle type. Oilraulic shock absorbers are incorporated in the vertical struts extending from the axle to the upper fuselage member. Bendix brakes are optional.

## Model A-329 Specifications

Span.....	34 feet
Length overall.....	24 feet
Height.....	8 feet
Wing area.....	210 square feet
Weight empty .....	1,200 pounds
Useful load.....	800 pounds
Gross weight loaded.....	2,000 pounds
Gasoline capacity.....	.60 gallons
Oil capacity.....	.5 gallons

## Performance (estimated)

With Wright Whirlwind 200 h.p. engine

Take-off.....	100 to 150 feet
Landing speed.....	50 miles per hour

High speed.....	140 miles per hour
Cruising speed.....	120 miles per hour
Climb (first minute).....	900 feet
Ceiling.....	27,000 feet

## Model A-429

The Model A-429, the Flyabout, is a two-place folding wing biplane powered with the Le Blond 60 horsepower radial air-cooled engine. The plane is equipped with single controls only.

Cockpit is upholstered with Fabrikoid. Floor-boards are of waterproof mahogany plywood, and aluminum footplates are placed under the rudder bar. A compact instrument board is located in the cockpit.

Wings are wired for flying lights. Gasoline feeds by gravity.

## Model A-429 Specifications

Span.....	27 feet 11 inches
Length overall.....	19 feet 7 inches
Height .....	7 feet 9 inches
Chord.....	4 feet 3 inches
Stagger .....	None
Gap.....	4 feet 3 inches
Area, upper wing.....	96 square feet
Area, lower wing.....	72 square feet
Total wing area.....	168 square feet
Weight empty.....	595 pounds
Useful load .....	400 pounds
Gross weight loaded.....	1,095 pounds
Gasoline capacity.....	12 gallons
Oil capacity.....	2½ gallons

## Performance

High speed.....	100 miles per hour
Cruising speed.....	85 miles per hour
Landing speed.....	25 miles per hour
Take-off.....	50 feet
Climb (first minute).....	900 feet
Ceiling.....	18,000 feet
Cruising range.....	4 hours

## Model A-129

Several improvements have recently been incorporated into the American Eagle Model A-129, the three-place open cockpit biplane which the American Eagle Aircraft Corporation, Kansas City, Missouri, has been producing for the past three years.

A forward cockpit door on the left side of the fuselage is built into the upper longeron. The upper wings are wired for flying lights.

The undercarriage is of the split axle type, and Bendix wheels and brakes are optional. A specially designed tail skid has been added.

The interiors of the cockpits are finished in Fabrikoid. Floorboards are waterproof mahogany plywood, aluminum plates being placed under the rudder bars.

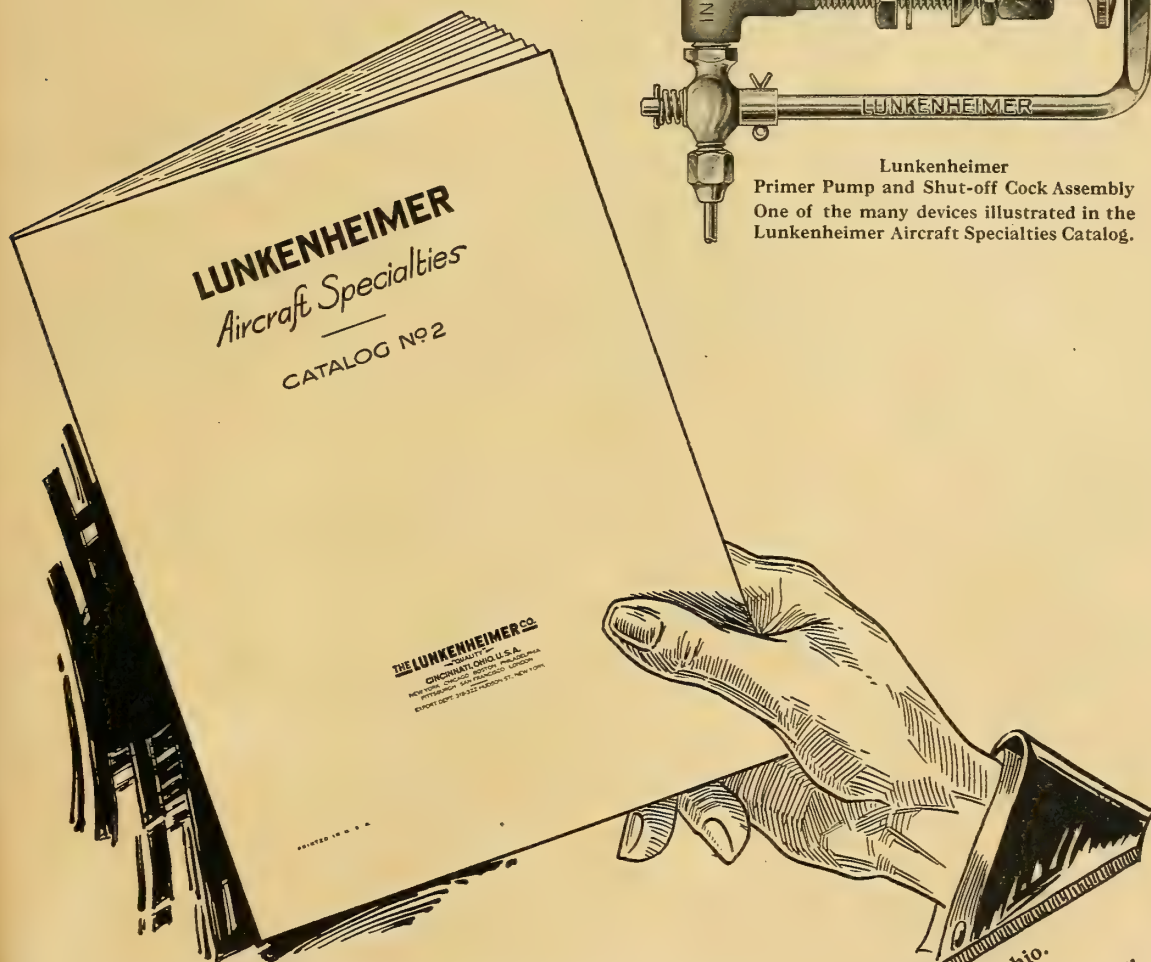
The twin-engined American Eagle cabin monoplane illustrated herewith is a six-passenger custom built model which was constructed for Dr. Walter M. Cross of Kansas City. The cabin of this plane is especially roomy, and the pilot's cockpit comprises a special compartment in the nose of the ship.



Upper picture shows the American Eagle Model A-429 Flyabout; center, a twin-engined custom built cabin monoplane; lower, the improved 3-passenger Model A-129

# Of Interest

*to all Aircraft Designers  
and Manufacturers*



**Lunkenheimer**  
Primer Pump and Shut-off Cock Assembly  
One of the many devices illustrated in the  
Lunkenheimer Aircraft Specialties Catalog.

The "Lunkenheimer Aircraft Specialties Catalog No. 2" shows a complete line of Pipe and Tubing Fittings and other Specialties for Aircraft.  
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"QUALITY"  
Gentlemen:

☐ Send me "Lunkenheimer Aircraft Specialties Catalog No. 2"  
☐ Send me information regarding the new Lunkenheimer  
Primer Pump and Shut-off Cock for use on  
Plane with \_\_\_\_\_ Motor.

Name \_\_\_\_\_  
Address \_\_\_\_\_

35-26-2



# THE B.F.W.M.20 COMMERCIAL PLANE

By

Dr. Carl Hanns Pollog

**T**HE new B.F.W.M.20 metal plane for passenger transport was designed by Herr W. Messerschmidt and is built by the Bayrische Flugzeug-Werke, of Augsburg, Germany. It has been developed out of the smaller type B.F.W.M.18, which has been in successful use in Germany for some time. The designer aimed at constructing a ship of high efficiency, but with low initial and operating costs. From eight to ten passengers and a crew of two may be accommodated in this plane.

This new type is a high-wing monoplane, with cantilever wing. The one-piece wing has one beam of double T profile and an auxiliary beam to which the ailerons are hinged. The ribs, made up of flanged and profiled sheets, are at right angles with the beam. From the beam to the leading edge (and in the center section, from the auxiliary beam to the leading edge), the wing is covered with duralumin sheets, the trailing portion being covered with fabric. The plan form of the tapered wing is a combination of rectangular and trapezoidal forms, while the tips are semicircular. The thickness of the wing decreases from 2 feet, 5½ inches at the root to 6 inches at the tips.

The fuselage is constructed of transverse bulkheads connected by longerons and stringers. It is covered with sheet duralumin in semi-monocoque fashion. The roomy cockpit for the crew is all-enclosed. It is accessible by means of a door from the passenger cabin. The large window at the side of the mechanic's seat is hinged so as to allow easy entrance and exit. Dual control is provided, and the controls at the mechanic's seat may be detached without difficulty.

Below the cockpit there are two baggage compartments. Aft of it is the roomy passenger cabin (15 feet 7½ inches by 5 feet 3 inches by 5 feet 11 inches). It contains eight comfortable leather chairs, with adjustable backs. There is a small folding desk in front of each seat. There are two additional folding seats in the cabin. At each fixed seat, there is a large triple glass window which may be lowered by means of a handle. The cabin is heated by warm air ducts; a temperature of 65°F. can easily be maintained at an outer air temperature of zero F. There is a trap below each seat which enables an inspection of the space between the floor and the lower fuselage cover. Also, the floor of the gangway is removable to afford access to the control gear. The chairs can be easily removed in case the space is to be used for freight or mails. The cabin space is especially adaptable to the transport of freight and mails only, or to the transport of newspapers, etc., for there are no structural members projecting into the cabin.

Aft of the passenger cabin is located the lavatory. In the tail portion of the fuselage there is a compartment for bulky baggage and freight.

The construction of the controlling surfaces is similar to that of the wing, i.e., one beam construction with duralumin ribs,

stabilizer and fin being covered with sheet duralumin, elevator, rudder and ailerons with fabric. The leading edge of the stabilizer is especially rigid. Neither elevator nor rudder is compensated, since their line of gravity nearly coincides with their turning axis. The controlling surfaces are so operated by a combination of levers, rods and steel wire ropes as to eliminate rope pulleys completely.

The axles of the landing gear wheels are two lateral struts which are connected with the fuselage by means of ball and socket joints and with the wing by two struts bearing rubber shock absorbers. The tail skid is movable.

The engine used is the 12-cylinder-inline water-cooled B.M.W.VI, with super-

charger, a compression ratio of 1 to 5.3, a Farman reduction gear of 1.61 to 1, and a normal output of 500 horsepower at 1,530 revolutions per minute. This ship can also be supplied with an air-cooled engine, e.g., with the Bristol Jupiter VI. The latter, however, necessitates a special motor mount. The engine cowl is removable, and a starter for the compressed air type is provided. The gas tanks of sheet brass are suspended in the wing; the oil tank, of the same material, is located in front of the fire-proof wall in the motor mount.

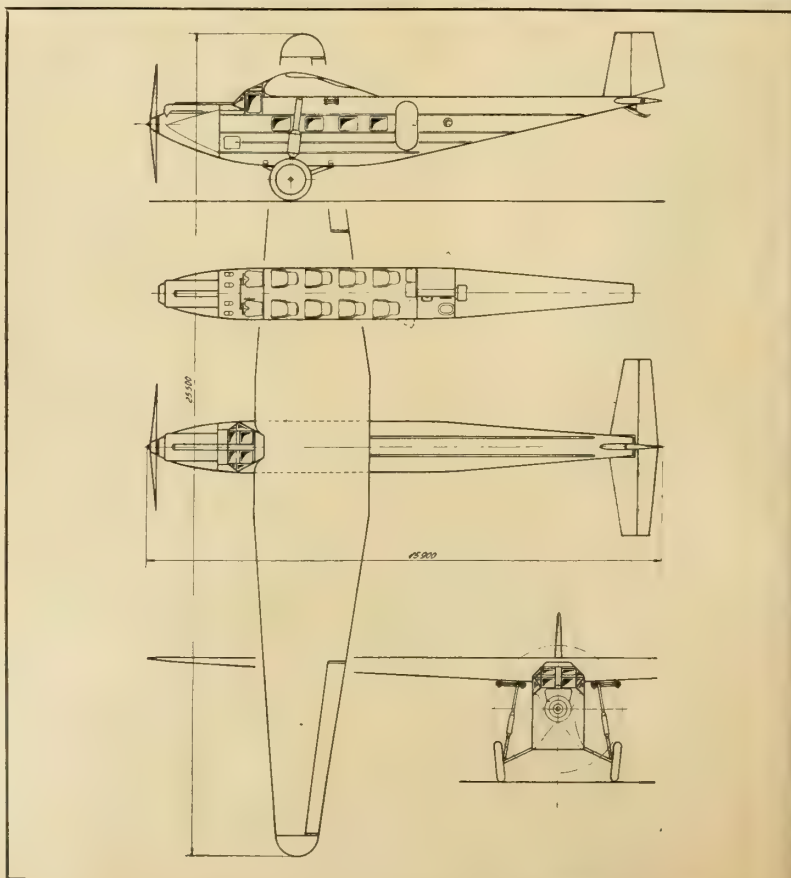
## General Dimensions

Span .....	83 feet 11 inches
Length overall .....	49 feet
Height overall .....	17 feet 1½ inches
Tread .....	11 feet 10 inches

## Areas

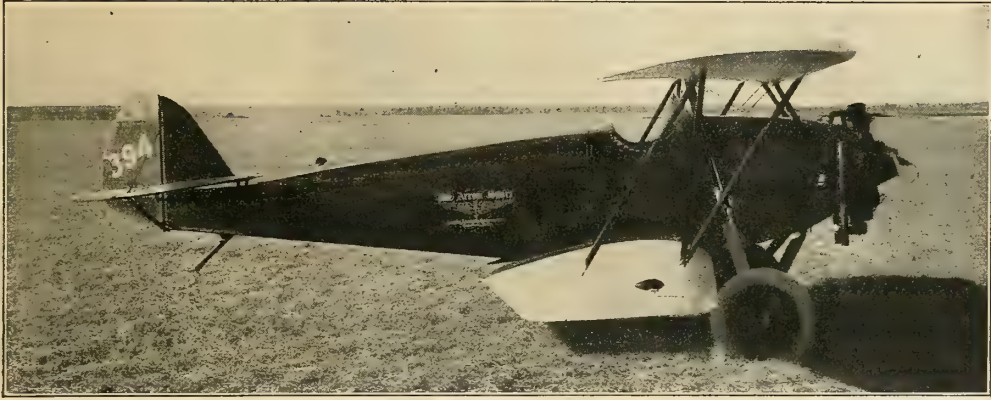
Wing (including ailerons) ..	700 square feet
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(Continued on next page)



Front view and outline drawings of the German B.F.W.M.20 commercial plane

# THE ARROW SPORT



**T**HE airplane that embodies those desired qualities of design and stability so necessary in the successful operation of training, business, and sport aircraft.

Companion cockpit with dual control makes it ideal for training. Small wing span—only 25 feet 6 inches—gives you a minimum storage charge. Take-off and land in 100 feet.

One of the country's best known pilots, after giving the ARROW SPORT a grueling test, said, "Biplane stability with monoplane efficiency".

*Can we say more?*

**Arrow Aircraft and Motors Corporation**



**Havelock, Nebraska**

**Don't fail to see this phenomenal ship at the New York Show**

*Your territory may still be open.*

*Please give references when writing.*



(Continued from preceding page)

Ailerons .....	98.1 square feet
Stabilizer .....	30.2 square feet
Elevator .....	34.5 square feet
Fin .....	15.3 square feet
Rudder .....	17 square feet

#### Weights and Capacities

Weight empty .....	5,290 pounds
Service load .....	1,810 pounds
Pay load .....	2,820 pounds
Useful load .....	4,630 pounds
Gross weight, loaded .....	9,920 pounds
Fuel capacity .....	158 gallons
Oil capacity .....	13 gallons

#### Performance

High speed .....	109 miles per hour
Cruising speed .....	97 miles per hour
Landing speed .....	56 miles per hour
Take-off run .....	625 feet
Rate of climb to 3,300 feet .....	8 minutes
Rate of climb to 6,600 feet .....	17 minutes
Rate of climb to 9,900 feet .....	27 minutes
Ceiling .....	16,500 feet
Range (8 hours) .....	550 miles
Wing loading .....	14.1 lbs. per square foot
Power loading .....	19.8 lbs. per hp.



Interior of the cabin, B.F.W.M. 20 commercial monoplane with seats removed

## THE ORIOLE SPORT PLANE

By Edward Johns

A NEW sport plane, named the Oriole, which will be placed in production by the newly organized Doyle Aero Corporation of Baltimore, has been built in that company's temporary plant at South and Lombard Streets and was given trials on November 8.

Flown by Lieut. Otto Melamet, operator of the Park Heights Flying School, from the school's field at Park Heights Avenue and Old Court Road, the Oriole took off after a run of about 200 feet. Lieutenant Melamet, also a National Guard flier, declared the craft performed perfectly both on the ground and in the air. A cross-wind of about twelve miles velocity was blowing at the time of the take-off.

The Oriole is a two-place parasol monoplane, with all-metal welded tubing fuselage and wooden wings, fabric covered. The

wing span is 30 feet, the length 19 feet, the weight empty 750 pounds, high speed developed in the test flight was 103 miles an hour and landing speed 40 miles an hour. It is equipped with a 60 horsepower LeBlond 5-cylinder air-cooled engine. Two gas tanks, each of 15-gallon capacity, are located in the wings.

In a subsequent flight to test the rate of climb, Lieutenant Melamet affixed a barograph and climbed to 4,000 feet in three minutes. The ceiling of the craft (without a passenger) was found to be 15,000 feet. It stunts easily, and the test pilot put it through all maneuvers.

The Oriole is painted in oriole colors; i. e., black and yellow. It has a V-type metal landing gear. The tail skid is composed of two leafs of spring steel, into which a bolt and nut is screwed to provide

an arresting force after landing.

The officers of the company are Harvey Doyle, president; Allen C. Davis, vice president; Wilson K. Doyle, treasurer and general manager, and Donald Primrose, secretary.

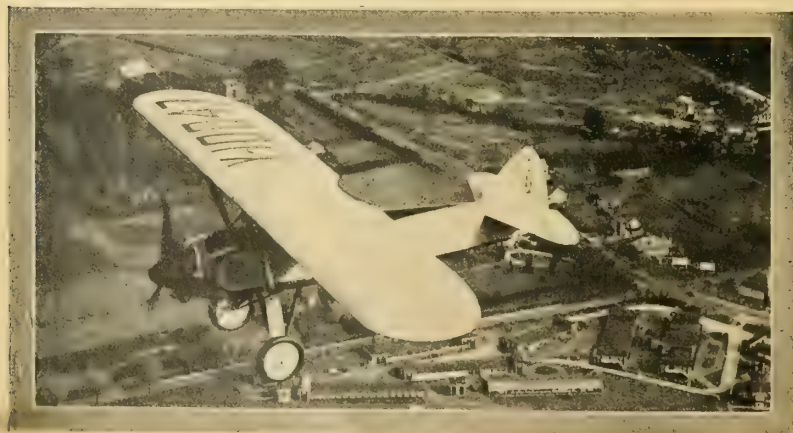
Harvey and Wilson Doyle are brothers and designed the American Moth, which won second place in the transcontinental race for Class A planes this fall.

### CHARACTERISTICS OF FIVE PROPELLERS IN FLIGHT

SYNOPSIS OF N.A.C.A. REPORT NO. 292.

THIS investigation was made by the National Advisory Committee for Aeronautics at Langley Field for the purpose of determining the characteristics of five full-scale propellers in flight. The equipment consisted of five propellers in conjunction with a VE-7 airplane and a Wright E-2 engine. The propellers were of the same diameter and aspect ratio. Four of them differed uniformly in thickness and pitch and the fifth propeller was identical with one of the other four with the exception of a change of the airfoil section. The propeller efficiencies measured in flight are found to be consistently lower than those obtained in model tests. It is probable that this is mainly a result of the higher tip speeds used in the full-scale tests. The results show also that because of differences in propeller deflections it is difficult to obtain accurate comparisons of propeller characteristics. From this it is concluded that for accurate comparisons it is necessary to know the propeller pitch angles under actual operating conditions.

Report No. 292 may be obtained upon request from the National Advisory Committee for Aeronautics, Washington, D. C.

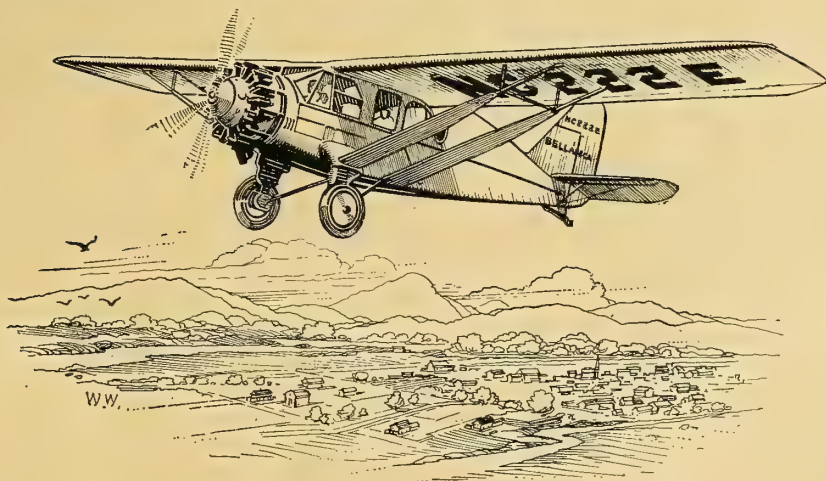


Oriole sport plane on its trial flight over Pimlico Race track, Baltimore

**THE BELLANCA CH****FIRST IN EFFICIENCY***Unequalled for Air Transport*

**B**IG BUSINESS demands the maximum speed in the race for supremacy. Air Transport ties up the far flung outposts of great corporations into compact, swiftly functioning units.

By winning 4 annual American efficiency contests, including 1928; by a world's distance record in 1927, and many notable endurance flights, Bellancas have established an unsurpassed record for sterling performance under all conditions.



Design and construction have built into Bellancas the qualities of stability, sturdiness and ease of control which have made them at home in the air. It was said of Lincoln Beachey that he could fly a motored barn door but one does not need the skill of a Beachey to navigate a Bellanca.

The Bellanca plant is being enlarged to meet the demand for the Bellanca CH, a cabin ship with a Wright Whirlwind motor, carrying six persons at 128 miles per hour.

Illustrated Booklet  
Mailed on Request

**BELLANCA AIRCRAFT CORPORATION**  
New Castle, Delaware



# TOWLE WC AMPHIBIAN

A STORY of the test flights of the new Towle WC Amphibian appeared in the December, 1928, issue of *AERO DIGEST*. This may now be supplemented with the following technical information concerning this ship. The Towle Marine Aircraft Engineering Co. of Detroit produced this amphibian.

The WC Amphibian is powered with two 150 horsepower Comet engines. By a simple modification of the system of struts supporting the wing and engine mounts, however, this type may be powered with Whirlwinds, or with four Warner engines in tandem. With a pay load of 1040 pounds, the plane can be flown with one engine only.

In general the plane consists of a rigid and seaworthy boat with a seating capacity of six or eight (according to the engine selection). It is of the all alclad dural sheet type of construction with a single step and sponsons.

Good visibility is obtained by locating the pilots' compartment in the front of the cabin. Triplex glass windows are used. From this position the pilot can also see his landing wheels.

Entrance to the cabin is afforded through two doors adjacent to the forward deck and an emergency exit in the rear of the cabin. Propeller hazard is eliminated on land by having a seven-foot propeller clearance to the ground.

The pilots' compartment is fitted with a centrally located control column. This column is hinged in the middle so that the upper end, bearing the wheel, can be swung in front of either seat. Provision is made to lock it in either position. Dual rudder pedals are provided and are hinged at the bottom. Controls for both engines are placed at the bottom and in the center of the instrument board. The pilots' seats are fabricated of sheet dural and are adjustable. Instruments are mounted on a dural instrument board which extends across the control compartment. All flying instruments are mounted on the left side, while the engine instruments are mounted in pairs on the right side.



The Towle amphibian in flight and afloat

Passengers not only can see out both sides, but through the forward windows as well. The upper walls and ceiling of the interior finish are upholstered in a rich auto cloth, while the lower portion of the walls, below the level of the windows, is finished in fabrikoid. The floor is covered with a carpet to match the walls and ceiling. The fittings are chromium plated, and walnut trim is used around the windows. These windows are of triplex glass and extend the length of the cabin. Four comfortably upholstered wicker chairs are provided. In the roof and at the side of the cabin are located two dome lights. A door in the rear wall leads to a space used as a lavatory. This space likewise is used for storing small personal baggage.

The 150 h.p. Comet engine, a product of the Aircraft Engine Company of Oakland, Cal., was described in the April, 1928, issue of *AERO DIGEST*. This engine is rated at

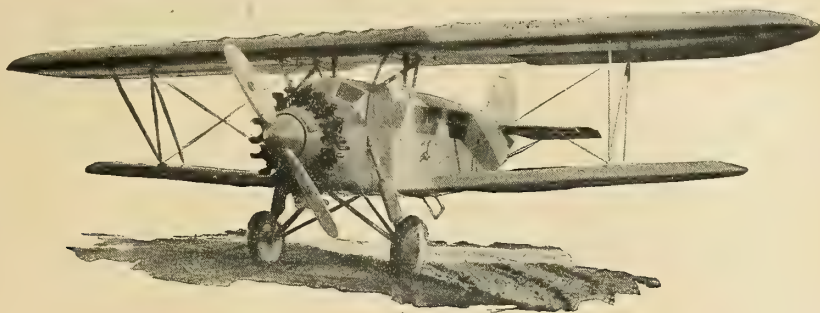
150 h.p. at 1800 r.p.m. It has seven cylinders, a bore of  $4\frac{1}{2}$  inches and a stroke of  $5\frac{1}{2}$  inches. Equipment includes Stromberg or Ensign carburetor, two Scintilla magnetos, and propeller hub for steel propeller.

## Specifications

Wing span .....	52 feet
Chord .....	8 feet
Wing area.....	404 square feet
Length, overall .....	33 feet
Weight loaded .....	4420 pounds
Weight empty .....	2750 pounds
Useful load .....	1670 pounds
Landing gear tread .....	8 feet
Fuel capacity .....	80 gallons
Oil capacity .....	10 gallons
Cruising speed .....	90 miles per hour
Maximum speed at sea level .....	110 miles per hour
Landing speed .....	45 miles per hour
Load per square foot of area.....	11 pounds

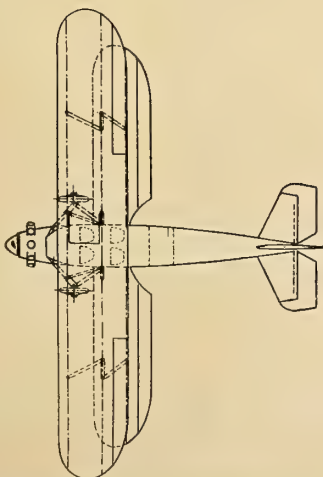
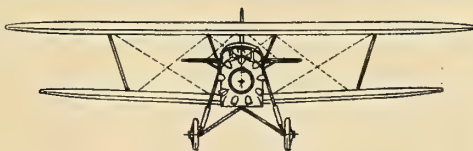
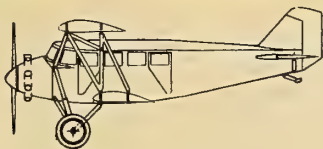


The twin-motored Towle WC amphibian monoplane powered with two air-cooled Comet engines



# The KNOLL KN-1

This new four-place biplane incorporates the most advanced practices of both American and European design. Notable throughout for highly developed aeronautical engineering, it is equally notable for the satisfactory way it meets the demands of present day practical operation. Extremely comfortable to fly, it is extraordinarily comfortable and convenient for passengers. The important problems of easy, economical inspection and maintenance have had the most careful consideration. For example the entire fuel supply is carried in the top wing. There are no fuel pipes or valves within the fuselage. The entire power plant is easily detachable as a unit making possible the complete change of engine within 10 minutes' time. There are countless other new features which will appeal to the private owner or the commercial operator.



## Major Characteristics

Length overall 23' 3"  
Height overall 9' 0"  
Upper wing span 33' 6"  
Lower wing span 28' 6"  
Aerodynamical area 264 square feet  
Weight empty 1800 lbs.  
Useful load 1250 lbs.  
Seating capacity—pilot and 3 passengers  
Maximum fuel capacity 180 gallons gasoline, 12 gallons oil  
Propeller—Standard steel  
Fuselage construction—1025 seamless steel tubing, fabric cover  
Wing construction—built-up spruce and birch spars, fabric and plywood cover. No interior bracing  
Landing gear—split axle type, Oleo-Pneumatic shock absorbers  
Tread—6' 4"  
Wheels 28x4  
Tail Skid—steerable and all parts interchangeable

Lachmann-type ailerons  
All controls balanced to permit hands-off flying under any conditions  
Complete instruments including fire extinguisher, first-aid kit and navigation lights  
Starter—inertia type with handle  
**PERFORMANCE**  
with 9-cylinder Wright Whirlwind 200 H.P. J-5 engine  
Absolute top speed, 140 miles per hour, fully loaded  
High speed (at 1800 rpm), 130 miles per hour, fully loaded  
Cruising speed (at 1600 rpm), 110 miles per hour, fully loaded  
Landing speed, 45 miles per hour  
Absolute Ceiling, 20,000 feet  
Service Ceiling, 14,000 feet, fully loaded  
Initial Climb, 13 feet per second, 3,000 feet in 4 min. 30 sec.  
Fuel Consumption, 12 gallons per hour at cruising speed

THE KNOLL AIRCRAFT CORPORATION  
Wichita, Kansas

AD2-Gray



# A real school

PAUL J. LANNIN, PRES

H. B. CLARKE, FIELD MANAGER

## ROOSEVELT FIELD FLYING SCHOOL INC.

ROOSEVELT FIELD  
LONG ISLAND N Y  
TELEPHONE WESTBURY 802

November Fifth,  
1928

The Kendall Refining Company,  
BRADFORD, PENN.

Gentlemen:

We feel sure that you would like to know the measure of success we have had with Kendall Products at the Roosevelt Field Flying School, Inc.

Because of the importance of keeping our school ships in perfect condition for our students, - we have been most critical of the products which we use for their maintenance.

After careful tests of several oils, we are now using KENDALL, not only for our own operations, but are recommending it to our visitors and customers.

Here are some interesting "Operation-Tests" which are evidence in our recommendation of KENDALL PRODUCTS:

1. School ship with OX-5 engine - 236 hours without overhaul using Kendall "G" exclusively.
2. School ship with OX-5 engine - 263 hours without overhaul using Kendall "G" exclusively.
3. 30 to 35 hours for average school ship without changing Kendall Oil.
4. On Whirlwind engines and OX-5's Kendall Oil has proven very efficient.

We extend our congratulations to KENDALL for its worth-while products.

Cordially,

ROOSEVELT FIELD FLYING SCHOOL, INC.

*Paul J. Lannin*  
President.



# conducts a real test of Kendall Penzbest Oil



*Scene at the start of the Transcontinental Air Tour of 1928 at Roosevelt Field, Long Island, the third largest airdrome in the U.S. and the location of the Roosevelt Field Flying School*

**U**NDER the supervision of Mr. Harry Booth, Chief Engineer at Roosevelt Field, Long Island, who is known for his distinguished accomplishments in aeronautical engineering, a series of genuine tests of the efficiency of Kendall Penzbest Oil was conducted by the Roosevelt Field Flying School. A summary of the splendid results of the tests is given on the opposite page in the letter from Mr. Paul J. Lannin, President of the School.

Some of the results reported: A school ship with OX-5 engine ran 236 hours without overhaul. Another ran 263 hours, 30 to 35 hours for the average school ship without changing oil. These are results that could have been achieved only with the finest lubricating oil available to aviation — Kendall Penzbest Oil.

The well known high standards of operation, inspection and maintenance prevailing at Roosevelt Field Flying School give it a standing second to no other flying school

in the country. The adoption of Kendall Penzbest Oil for general use at the school is an endorsement which the makers are proud to acknowledge and which could be won by merit alone.

The reason why Kendall Penzbest Oil enables an engine to run a record-breaking length of time without overhaul . . . why Kendall Penzbest Oil need not be drained oftener than every 30 hours . . . is because the oil is highly resistant to extremes of temperature and the influences of contamination. Its ability to circulate instantly the engine is started and to maintain an even viscosity under all conditions, assures good compression, less friction, less wear. Kendall Penzbest qualities are derived from its source—100% Bradford Grade of Pennsylvania Crude, recognized beyond question as the world's finest grade.

For a list of airports where Kendall Penzbest Oil is now obtainable, address Aviation Division, Kendall Refining Company, Bradford, Pa.



# KENDALL PENZBEST MOTOR OIL



REFINED FROM 100% BRADFORD  
GRADE OF PENNSYLVANIA CRUDE



# THE AIR SERVICES

## U. S. NAVY FLEETS "BATTLE" AT CANAL

THE United States Navy's Fleets are now engaging in the greatest concentration yet attempted, the annual tactical exercises being conducted in the vicinity of the Canal Zone. Both the fleet from the Pacific Coast and that from the Atlantic are engaging in a huge sham "battle" in which tests of the latest Naval tactics are being employed, and as never before, the Navy's huge air force is being brought into action.

Over two hundred planes, more than half of which are Vought planes of the Corsair type, are being used for all phases of work in connection with the maneuvers. The planes are being catapulted from the scout cruisers and battleships to find the "enemy" craft and to spot for the long-range indirect fire from the heavy guns of the battle fleet.

The aircraft carriers U. S. S. *Saratoga* and *Lexington*, each with her complement of over eighty planes, are taking part in their first maneuvers, one carrier being assigned to each of the "opposing" fleets. Each of these new ships carries a wide variety of planes including several squadrons of Vought Corsair observation planes, bombing planes, and torpedo planes. The two carriers alone will bring into action more planes than ever before were engaged in Naval maneuvers.

## SAFETY-SLOT WINGS ON VOUGHT CORSAIR

AT Mitchel Field, Long Island, a maneuver never before executed was carried out recently in a high-performance Vought Corsair flown by Lieut. C. B. Harper of the U. S. Naval Air Service. The Corsair was taken to an altitude of about 10,000 feet and deliberately put into a fast, vicious spin by the pilot. When some ten turns had been completed on the way down, the pilot merely pressed a lever in the cockpit and the plane was brought out of the spin in a half turn. This lever unlocked automatic safety slots on the leading edge of the upper wings, and the opening of these automatic slots quickly recovered the plane from the spin in the half turn, whereas recovery normally takes from two to four full turns with great loss of altitude.

The Chance Vought Corporation was selected by the Navy Department to develop this newest safety device for installation on fighting and observation planes. This slotted-wing installation on the Vought Corsair is the first ever made on an American military plane, and is, in fact, the first installation ever tested in which the slots can be locked, for in all of the British installations the apparatus cannot be locked in a closed and inoperative position. With the locking feature the installation does not affect maneuverability or other high performance military characteristics of the Corsair.

The results of the tests indicate an unusual future for this new airplane safety device, both for military and commercial use, inasmuch as it makes it possible for even an inexperienced pilot to bring a plane out of a spin, and also because it makes it possible to land at greatly reduced speeds.

## LT. ENT TO RECEIVE CHENEY AWARD

SECOND LIEUT. UZAL G. ENT, Army Air Corps, has been designated to receive the Cheney Award for the year 1928 for courage, daring and heroism displayed by him during the National Elimination Balloon Race (which started from Bettis Field, Pittsburgh, Pa., on May 30, 1928), when the balloon in which he and Lieut. Paul Evert were aloft was either struck by lightning or received a heavy charge of electricity, as a result of which Lieut. Evert was instantly killed.

Lieut. Ent is to receive a cash award of \$500, a bronze plaque with his name engraved thereon, and an engraved Certificate of Award.

## ARMY-NAVY STANDARD- IZATION CONFERENCE

THE fifth annual Army-Navy conference for the standardization of aeronautical materials and parts will be held at the Naval Aircraft Factory, Philadelphia Navy Yard, during the week beginning February 11. Representatives of the entire aircraft industry are invited to attend so that the decisions may be correlated with the latest commercial practices.

At a preliminary conference of Army and Navy representatives, tentative specifications and drawings were prepared which have been distributed throughout the industry for consideration and study. The results of this study will be discussed at the conference.

## AVIATION PILOT ELIMINATION COURSES

IN order to improve the quality of students entering Pensacola for aviation pilot training, the Bureau of Navigation has established elimination courses at the Naval Air Station, Hampton Roads, Va., and San Diego, Calif., the students to be recruited from the training station. The length of the course is to be ten flying hours.

The following quota has been established:

From Naval Training Station, Newport, to Naval Air Station, Hampton Roads, quota per week, 3.

From Naval Training Station, Hampton Roads, to Naval Air Station, Hampton Roads, quota per week, 4.

From Naval Training Station, Great Lakes, to Naval Air Station, San Diego, quota per week, 4.

From Naval Training Station, San Diego, to Naval Air Station, San Diego, quota per week, 5.

All men who successfully pass the course will be transferred to the Aviation Mechanics School, Great Lakes, Ill., and entered as students in the General Utility Course of the Aviation Mechanics School. Upon completion of this course, they will be transferred to the *Saratoga* and *Lexington* in about equal numbers until ordered to Pensacola.

## ARMY AIR CORPS ORDERS 450 WASPS

THE Pratt & Whitney Aircraft Company has received orders from the United States Army for fifteen 450 horsepower Wasp engines and spare parts. The order represents a total value of approximately \$100,000. The Army will use these engines in large Ford and Fokker trimotor transports, which type of plane, powered with Wasp engines, has already seen a great deal of service in passenger transportation, both in the middle and far west.

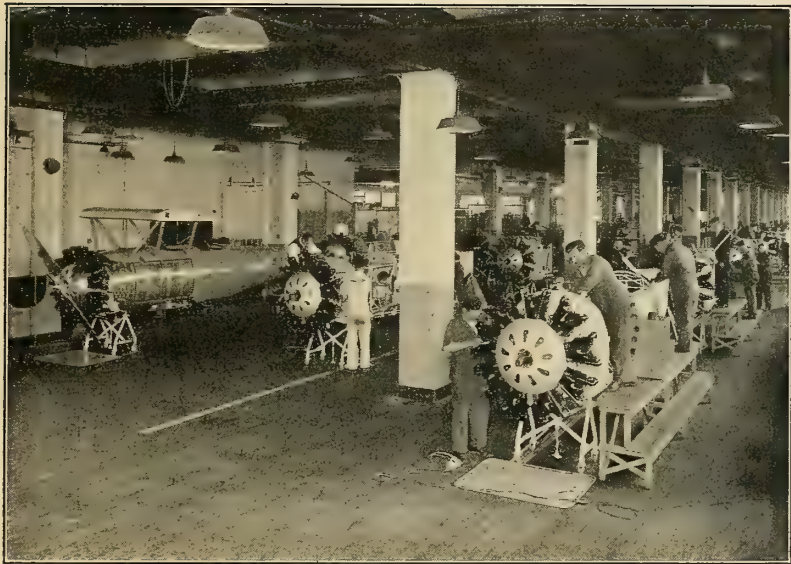


The U. S. Navy's Vought Corsair equipped with wing slots

# The VOUGHT ORGANIZATION

the BACKGROUND of

## The "CORSAIR"



A VOUGHT ASSEMBLY LINE

*Chance Vought Airplanes embody the most modern production methods, the most painstaking accuracy and the most advanced engineering.*

**T**HE CHANCE VOUGHT ORGANIZATION, indeed, has an enviable record and a remarkable background. Mr. Chance Vought, the head of the organization, is one of the country's pioneer pilots, having learned to fly in 1910, and since that time has devoted his entire efforts to the aircraft industry, designing and building a long series of outstanding and advanced types of aircraft.

And practically all the executives and many others in the Vought Organization are seasoned pilots and engineers who know flying as an everyday job, and consider their work both as a business and pleasure.

In twelve years Vought planes have progressed from

the VE-7—which easily won the Army war-time training plane competition—to the latest "Corsair," which has officially shown itself to be the finest plane of its type in the world, and which has established Four World Records for speed and altitude.

Small wonder then, that Vought planes, with their background of high performance and reliability in the most difficult missions, have become a favorite with those who fly, and were flown over 3,500,000 miles in our Naval Air Service in 1928, to establish a new operating record.

In military, commercial or private service—over land or water—no task is too difficult for the "Corsair."

# CHANCE VOUGHT CORPORATION



LONG ISLAND CITY . . . . . NEW YORK



# *When the Battle*



Say you saw it in AERO DIGEST

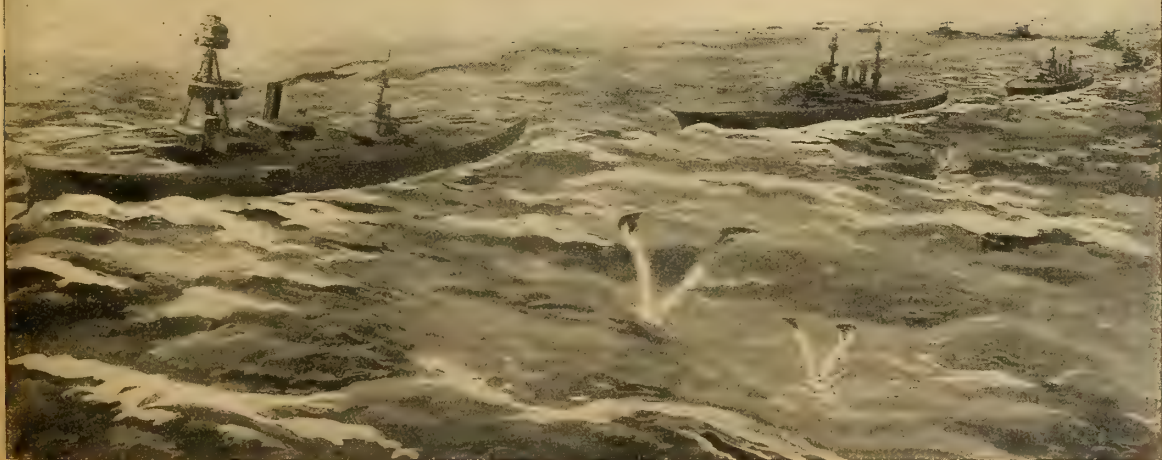
# Fleet Goes to Sea /



Swinging into formation, and setting its course for southern waters, the United States battle fleet on its annual winter cruise presents one of the world's most modern and formidable units of naval equipment. This is in keeping with the high traditions of the United States Navy—traditions that insist upon the finest equipment and the best-trained personnel in the world.

Included in the armament of the battle fleet are the newest and best aircraft known to modern science. It is significant that more than two hundred of these "flying guns" are equipped with Pratt & Whitney engines. The "Wasp" and "Hornet"—always leaders in their field—are now standard units of America's first line of defense.

**THE  
PRATT & WHITNEY AIRCRAFT CO.  
HARTFORD CONNECTICUT**





# WESTERN NEWS

## HONOLULU AIR NEWS

By VERNE HINKLEY

**C**APTAIN CHARLES KINGSFORD-SMITH and Lieut. C. T. P. Ulm, the master and mate of the *Southern Cross*, Oakland to Australia monoplane, have definitely decided against a flight from Honolulu to the Pacific Coast. Such was the word brought here recently by Cecil C. Maidment, Wright motor expert, who has returned to the mainland United States after having been with Kingsford-Smith and Ulm for a number of weeks and having given the Whirlwinds of their Fokker a complete overhaul.

Maidment found the *Southern Cross* in fine condition after her long voyage across the western seas.

**P**LANs for the construction of a hangar at the John Rodgers Airport, Honolulu's municipal flying field, are being held in abeyance until the members of the territorial aeronautical commission decide just how much of their remaining appropriation can be spent on such a building. The contemplated project calls for the erection of a hangar 70 feet wide and 100 feet long, fashioned of light steel work.

The commission also plans to complete the grading on the airport in the near future.

**A**N ambitious program for the immediate development of two new combined civil and military airports on the waterfront of Honolulu has been drafted by the territorial board of harbor commissioners and submitted to the governor. The scheme comprises a widening of the channel which gives entrance to the harbor, the material so sliced away to be transferred to both east and west sides of the channel and impounded behind a thick stone wall. On the west, engineers have calculated, a flying field of at least 1,300 acres could be formed while on the east more than 400 acres would become available.

Such airports as these two would be ideally situated insofar as accessibility is concerned. Plane passengers could be in the heart of the city within five minutes after landing on either of them. Both would face into the prevailing trade winds, and the larger would be of such an area that take-offs would be possible when a Kona, or southerly breeze, was blowing.

**W**ITH a rapidly increasing enrollment, the mechanical courses at the Hawaiian Aeronautical School are now being conducted regularly. The curriculum includes the study, under separate heads, of airplanes and engines, each of which is subdivided into theoretical and practical courses.

The evening classes, which are held twice a week, consist of lectures on the theoretical phases of aviation. These classes extend over a period of three months.

The practical work is carried on daily

either in the daytime or at night. Lasting a year, this practical training includes shop work and field service.

A. H. Shuttlewood is president and general manager of the school; L. H. McCurley, vice president; J. S. Nobles, secretary; Glenn T. Clark, treasurer; Harold J. Edsall, auditor; and Edward H. Himrod, advertising manager.

## PILOT KELLY FLIES 115,760 MILES IN 1928

**A**IR MAIL PILOT FRED W. KELLY, former Olympic hurdle champion, flew more miles during 1928 than any other air mail pilot in the United States, and set a new world's record for actual mileage in the air during the year. He is chief pilot on the Los Angeles-Salt Lake City air mail and passenger route of the Western Air Express, and his year's record is 115,760 miles.

## CALIFORNIA AIR NEWS

**A**RCHIE ATHERTON, chief parachute demonstrator of the Russell Parachute Company, has been appointed instructor of parachutes at the San Diego Air Service flying school. Students at the school, upon completion of their courses, will make a tour of inspection of the Russell plant to learn the methods of manufacture, repair and operation of parachutes.

In addition, students at the San Diego Air Service school are to be taught aeronautical meteorology by Dean Blake.



Underwood & Underwood

Fred W. Kelly, Western Air Express pilot, who flew 115,760 miles in 1928

**T**HERE are now 135 flying students enrolled at Dycer Airport, school of commercial aeronautics at Los Angeles. A ground school course, without additional charge, is a regular part of the curriculum. Four students were soloed recently within a period of seven days.

The record of the flying activity at Dycer Airport during 1928, is as follows: flying-time, 885 hours; student trips, 1,866; passengers carried, 1,263; total trips, 2,734; miles traveled 57,455; planes sold, 12. No plane has ever been damaged by a solo flight.

Jack Euler, former air mail pilot with the Colorado Airways, has succeeded George Miller as student instructor.

**G**RADUATING with a high average of 98 per cent for the complete term is the excellent record of Herman Hamel, honor student of the 1928 ground course at Western College of Aeronautics, Los Angeles. As a result of the achievement, he receives his tuition free.

Hamel is twenty-one years of age. Before enrolling at Western College of Aeronautics, November 14, 1928, he attended the University of Washington and was also an employee of the American Aircraft Corporation in Los Angeles. After entering the college he was employed, in his spare time, in the motor repair department, where he gained practical experience for his ground school course. Hamel has completed the ground and flying courses and will enter the engineering class February 1.

**T**HE Noran Aircraft Company is increasing production on the first of February to six planes a month. The company is signing dealers and distributors for the Bat monoplane. Starting the first of February, sales will not be made to the student direct, but distributors will be signed in every section of the country for the sale of the Bat P-1 and Bat P-2. The Noran company expects to move into its larger quarters about the middle of March so that production can again be increased.

**O**N December 27th, in commemoration of the 25th anniversary of the first airplane flight, the members of the Women's Aeronautic Association of California were the honor guests at the Women's Breakfast Club of Los Angeles. At a luncheon on January 2nd at the Biltmore Hotel, they heard Princess De Ling's interesting talk on aviation in China.

The Women's Aeronautic Association hopes soon to acquire the use of a hangar, airplanes, etc., and plans to be represented during this year at all exhibitions, conferences and conventions.

Mrs. Elizabeth L. McQueen is founder and president of the association; Mrs. Dora A. Stearns, vice president; Mrs. Edna Covert Plummer, secretary; and Mrs. Lena R. Pepardine, treasurer. (Continued on next page)

# WHY

DID MAJOR CARL SPATZ SELECT THE  
LOS ANGELES METROPOLITAN AIRPORT  
AS THE BASE FOR THE "QUESTION  
MARK" EPOCHAL ENDURANCE TEST

**BECAUSE—**

"ON BOARD THE QUESTION MARK"  
Jan 3, 1929.

Dear Adamson:—

The Los Angeles Valley is covered with fog. We would be on ground if we had not selected the field in the San Fernando Valley known as the Los Angeles Metropolitan Airport.

Spatz

**BECAUSE—**

"ON BOARD THE Q M"  
Over Southern Calif. Jan. 6, 1929.  
Sixth day of flight 9:32 A.M.

Metropolitan Airport

Mr. Waldo Waterman, Gen. Mgr.

My dear Waterman,

The motors are beginning to labor and it is only a question of time until we shall again use your landing area. The night lights have been excellent. It has given us confidence to know an excellent airport was beneath us in case of a forced landing. While still up in the air the crew want to thank you for the untiring effort you have made and the assistance you have been to us.

Sincerely,  
Carl Spatz

**BECAUSE—**

**PRIVATE OWNERSHIP AND MANAGEMENT ENABLED  
FACILITIES PREPARED WITH EXCEEDING DISPATCH**

## LOS ANGELES METROPOLITAN AIRPORT

EXECUTIVE OFFICES:  
411 Hollywood Security Bldg.  
Hollywood, Calif.  
Phone Gladstone 1165

**WALDO D. WATERMAN**  
General Manager

AIRPORT:  
Saticoy & Woodley Streets  
In The San Fernando Valley  
P. O. Box 1338, Van Nuys, Calif.  
Phone Van Nuys 522



(California Air News continued)

THE City of Santa Monica sends us specifications of Clover Field, which is being operated under the management of Duff Willson as a municipal airport. Its dimensions are 700 by 2800 feet and it comprises 49 acres. The landing strip is 2800 feet in length, comprising the entire field, oiled loam surface with a one per cent gradient, making landing from any direction possible. The wires and poles at the northeast end of the landing field are 24 feet high. The standard 100-foot light circle is provided. Personnel for servicing and maintenance, repair facilities, spare parts and fuel are available.

THE Lockheed Aircraft Company of Los Angeles plans a production schedule of 200 planes during 1929. A new assembly plant is to be constructed near Chicago, and the company's California plant is to be expanded.

Schlee and Brock, Lockheed distributors in the Middle West, have contracted for planes amounting to \$750,000.

ELABORATE plans are being made for the formal opening on February 17 of the Grand Central Air Terminal at Glendale, Calif.

This field, backed by C. C. Spicer, Los Angeles capitalist, will represent an outlay of more than three million dollars when finally completed. With one half mile of buildings two rows deep, and with two concrete take-off runways and one concrete taxi runway one half mile in length, it will be one of the finest airports in America.

Maddux Air Lines, first lessees, have completed their first hangar, 400 feet in length, offices 200 feet by 30 feet and shops, with power machinery, 200 feet by 30 feet.

THE Gordon S. Stryker Aircraft Company of Los Molinos, Calif., is working on its own monoplane, which is in the experimental stage, and rebuilding a Waco-10 owned by Ed. Bragdon, of Red Bluff.

ARTHUR H. VULTEE was recently appointed sales manager of the Lockheed Aircraft Company of Los Angeles. He is a brother of Gerard F. Vultee, chief engineer for the company.

THEODORE (TED) SCHLUETER has been assigned as sales supervisor on the Pacific Coast for the Mahoney-Ryan Aircraft Corporation.

A NEW women's world altitude record was set by Louise McPhetridge Phaden, who reached a height of 22,500 feet in a flight at San Francisco.

For the flight she used a stock model Travel Air, Type 3000, powered with a Hispano Model A motor equipped with a set of Champion aviation spark plugs which were part of her engine's original equipment.

THE Douglas Aircraft Company of Santa Monica is operating at full capacity to fill the orders booked ahead. On January 1, the company had about \$2,900,000 in orders to be filled during 1929. The Army Air Corps has ordered more Douglas planes of the type already in service and a new experimental model.

The company's new plant, which will add considerably to production, is now under construction.

MUTUAL AIRCRAFT CORPORATION is operating a daily air express and passenger line from San Francisco to Los Angeles, via Fresno and Bakersfield. Southbound planes leave Alameda Airport, San Francisco, at 11:10 a.m.; leave Fresno at 1 p.m.; leave Bakersfield at 2:25 p.m.; and arrive at Clover Field, Los Angeles, at 3:40 p.m. The northbound Midnight Express leaves Los Angeles at 12:01 a.m., arriving at San Francisco at 6:10 a.m. A daily afternoon flight is made from Los Angeles to Bakersfield only and return. A fleet of Ryan Broughams is used on the Mutual Airlines.

## SAN FRANCISCO NEWS

REFLECTING the phenomenal progress of commercial aviation during 1928, the annual business report of San Francisco's municipal airport at Mills Field, covering the past twelve months, shows 19,457 flights, with 33,545 passengers.

In the eight previous months since the airport opened in May, 1927, there were 2,895 flights and 4,560 passengers, making a grand total of 22,352 flights and 38,105 passengers. For the same months in 1928, there was a business increase of approximately 600 per cent.

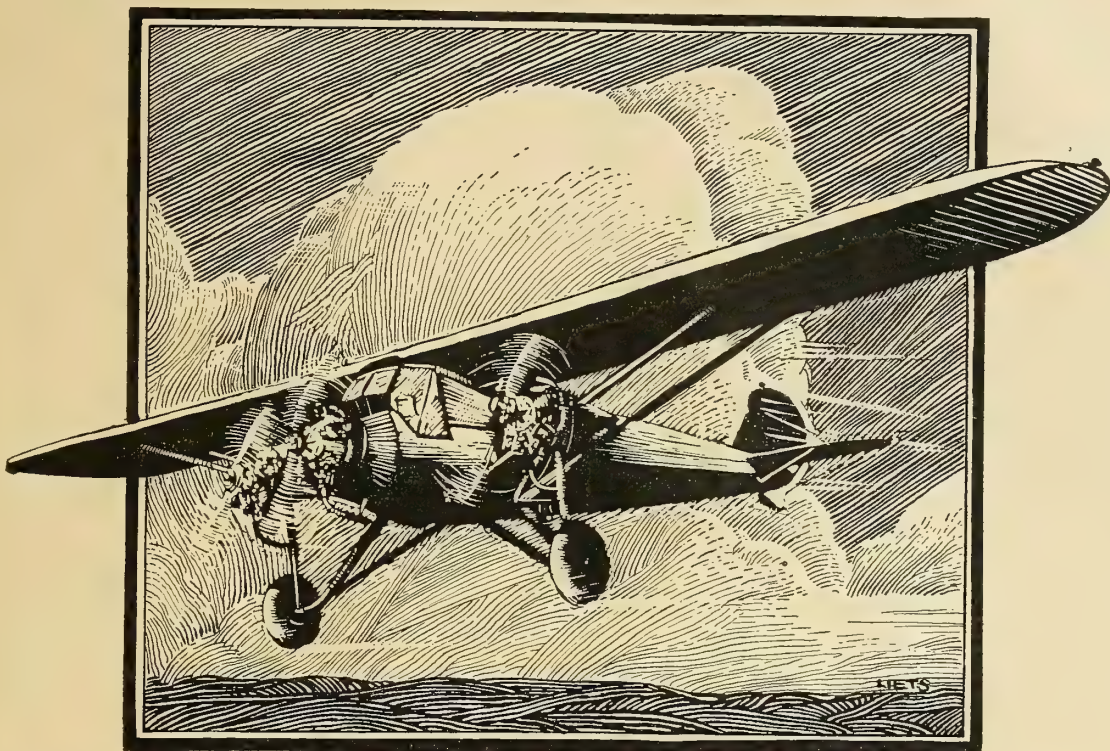
MILLS FIELD has been adopted as a model by the Australian government in connection with its plan to construct scores of airports throughout Australia.

Colonel C. H. Brinsmead, Controller of Aeronautics for Australia, and Captain Jeffrey Hughes, President of the Sydney Flying Club, who represented Australia at the recent International Aeronautics Conference in Washington, secured from Supervisor Milo F. Kent a copy of the San Francisco airport plan, declaring it would be followed closely by the Australian government in its airport development program. They also stated that the City of San Francisco would be officially requested by the Australian government to commission one of the city engineers, familiar with the construction of Mills Field, to supervise the building of the new Australian airports.

TOTALS for 1928 on Boeing Air Transport, San Francisco and Oakland to Chicago route are: miles flown, 2,178,365; mail carried, 986,279 pounds; passengers carried, 1,863; passenger miles flown, 1,279,778. Totals for 1928 on Pacific Air Transport, Seattle-Los Angeles, are: miles flown, 703,542; mail carried, 137,972 pounds; passengers carried, 1,484; passenger miles flown, 506,509. Since inauguration July 1, 1927, 3,335,973 miles have been flown on Boeing lines.



The newest type Boeing mail plane, Model 95, which has a top speed of 140 miles an hour



## NORTH . . . EAST . . . SOUTH . . . WEST

from every point of the compass dealers and distributors are writing for the Kreutzer franchise. They realize that the Kreutzer Tri-Motor Air Coach has been built to meet the specifications of an existing market . . . that the ship which combines tri-motor safety (it is able to maintain level flight on its nose

motor alone) with high performance and maneuverability, great carrying capacity, fine visibility, luxurious comfort for six and low maintenance and astonishingly low first cost, is a profitable ship for the dealer because it is a profitable ship for the purchaser. There is still valuable territory open.

**WRITE  NOW!**

**K R E U T Z E R   T R I - M O T O R   A I R   C O A C H**  
SIX PLACE . . . . DUAL CONTROL . . . . CABIN . . . . MONOPLANE

**JOSEPH KREUTZER**  
C O R P O R A T I O N  
656 Chamber of Commerce Bldg. -- Los Angeles



## OAKLAND AIR NEWS

**D**URING the year 1928, 66,432 plane landings were recorded at Oakland Municipal Airport, 40,691 passengers were carried, 8,297 student flights were made and the gross revenue totalled \$30,794.34. Transient plane landings at the airport during the year totalled 3,443. Passengers carried in transient planes totalled 4,732.

**T**HE largest shipment of airplane supplies ever shipped to the West was sent to the United Aircraft Corporation, at Oakland Municipal Airport.

The lot shipment, comprising more than 2,200 items, was shipped by the Nicholas-Beazley Airplane Company of Marshall, Mo. The United Aircraft Corporation, which occupies a 20-foot by 100-foot space in the lean-to adjacent to hangar No. 4, represents the Nicholas-Beazley interests locally.

**A**IRCRAFT INDUSTRIES, INC., of Oakland, is turning out a glider in its factory near Oakland Municipal Airport. It will have a wing span of 36 feet 6 inches and an overall length of 18 feet 6 inches. It is to be used by the San Francisco glider club for the instruction of students.

**J**OHN WOGGEE of Oakland has purchased the Hisso Travel Air in which Louise McPhetridge Thaden recently set a new altitude record for women (22,000 feet). Woggee is to operate commercially at Oakland Municipal Airport. D. C. Warren

made the sale and has also sold a Travel Air biplane to Boldt and Bannister, Oakland airport operators.

**C**ONSTRUCTION of Hegenberger Road, the \$75,000 speedway which will connect downtown Oakland with the municipal airport, is now under way.

This road, which will be two and one half miles shorter than present highways to the airport, will be ready for use early next summer.

**G**EORGE PARKER of Berkeley has been added to the full-time flying staff of Metro Air Service at Oakland Municipal Airport.

Sam Metzger of the Metro service has gone to Hawaii where he will establish a branch agency for Stearman airplanes.

**C**APT. IENAR ELM, a former Army flier, has signed with Maj. Livingston Irving to conduct the ground school classes of the Irving and Rhodes Flying Service at the Oakland airport.

## CALIFORNIA NOTES

By RUSSELL GRIGSBY

### Stockton

**S**TOCKTON MUNICIPAL AIRPORT, located 3 miles south of the city limits of Stockton, now has a good hard packed and oiled runway, an illuminated wind pennant, a 8,000,000 candlepower beacon, a 3,000-watt Westinghouse floodlight, a clear field

of 111,197 acres, a large class of students, and a good assortment of planes.

Clayton Allen and Jack Knightingale are managers of the airport. Allen has a large class of students. They both run a taxi-plane service also.

Bill DeVries runs the Eaglerock Air Service, has a large class of students, and also a taxiplane service.

Les Moore and Howard Gardner have a Waco, carry passengers, students, and do photography, and taxiplane service.

J. H. Wrench and C. L. Werl have a Jenny for a sport plane.

Julius Gouch is building a small sport monoplane.

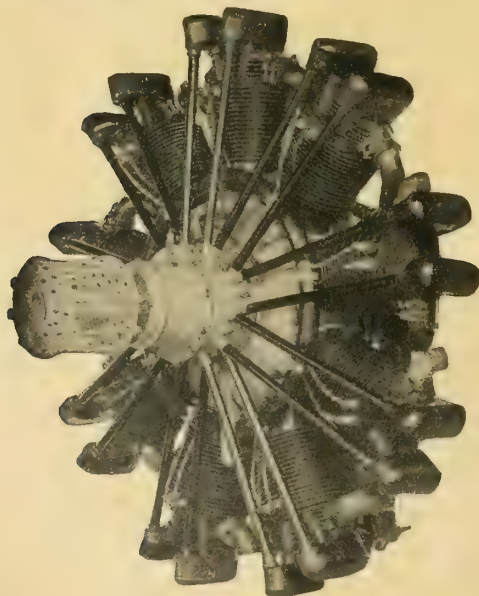
Fred Gomez and Ray Eproson have a Heath Parasol with an Anzani engine. They are building up a sport biplane with a 3-cylinder Anzani motor.

With the cooperation of the Chadbourne Aircraft Sales Co., distributors of Lockheed Vega monoplanes, Russell Grigsby and Sam Finnerty are organizing the Air Transport Co., of Stockton, to carry mail, express, and passengers from Alameda, Oakland and San Francisco, to Stockton, Yosemite Valley, Mariposa Big Trees, Mono Lake, Calaveras Big Trees, Silver Lake, Lake Tahoe and Donner Lake.

Harvey Lempke, E. W. Friman, and Bill Shine have brought the Lockheed Vega demonstrator up from Mills Field several times and have given a large crowd of prospective buyers a good ride.

(Continued on next page)

## ~ MENASCO ~



This powerful engine possesses engineering perfection of the finest degree, insuring dependability and long life.

\$3250 F.O.B. Los Angeles

Specifications on request

**MENASCO MOTORS COMPANY**

6718 McKinley Avenue

Los Angeles



## LOCKHEED

**fuselage construction insures  
lowest maintenance cost--**

- permanent alinement
- no recovering . . . .
- easy to repair . . . .
- fewer parts . . . . .

### DISTRIBUTORS

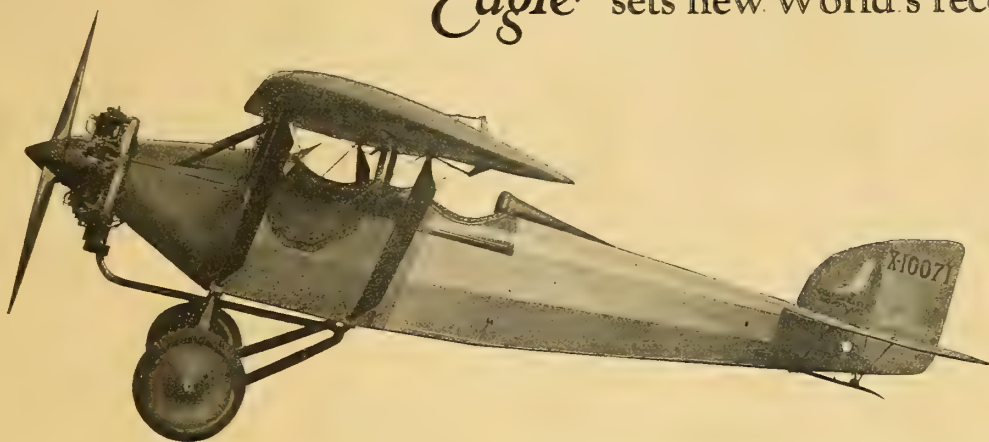
Air Associates, Inc. . . . . New York  
Schlee-Brock Aircraft Corp. . . . . Detroit  
Erle P. Halliburton Co. . . . . Duncan, Okla.  
Harry Sperl Aero Corp. . . . . Los Angeles

Wasp-Vega Approved Type Certificate D. of C. No. 83  
Whirlwind-Vega Approved Type Cert. D. of C. No. 49

**LOCKHEED**

**AIRCRAFT COMPANY  
LOS ANGELES, U.S.A.**

# Miss Bobbie Trout, flying *The Golden Eagle*—sets new World's record



## SPECIFICATIONS AND PERFORMANCE DATA:

Length overall .....	21 ft.
Height overall .....	7 ft.
Span .....	30 ft., 6 in.
Chord .....	5 ft., 6 in.
Weight empty .....	800 lbs.
Gross weight loaded .....	1350 lbs.
High speed .....	95 m.p.h.
Cruising speed .....	80 m.p.h.
Landing speed (guaranteed).....	30 m.p.h. or less
Climb at sea level (full load).....	450 ft.p.m.
Range at cruising speed .....	5 hrs.
Power plant.....	Velie M5 or any other motor up to 300 pounds.

## STANDARD EQUIPMENT

Propeller Cap  
Fire Extinguisher  
Emergency Tool Kit  
Dual Instrument Boards  
Detachable Engine Mount  
Consolidated Instrument Panel,  
including altimeter, tachometer,  
oil pressure gauge, oil ther-  
mometer, switch, altitude con-  
trol and choke.

## PRICES

Two-place, dual con-  
trol, less engine \$1800  
Velie 60 H.P. 5 cyl-  
inder engine with  
propeller .....\$950  
Ships may be had in  
any color combina-  
tion at no extra cost.

MISS BOBBIE TROUT, the 18-year-old California aviatrix, recently established a new high mark in World's Endurance Records for Women—12 hours, 11 minutes.

Miss Trout accomplished her flight in one of the first Golden Eagle production jobs off the line—a ship which has since undergone several noteworthy improvements. Miss Trout has demonstrated very definitely that the Golden Eagle is a remarkably easy plane to handle. She weighs only 110 pounds, and as she herself states, no person of her build could possibly keep a plane aloft for so many hours unaided, in constantly changing winds, unless the ship flew “hands off” most of the time.

It has been our intention since first instituting the manufacture of these ships to place on the market a safe, easy handling training plane that would sell at a moderate price and operate at the lowest possible cost per hour.

*Thanks to Miss Trout, we have been able to put our story across quite forcibly.*

Prospective students will be pleased to know that the Golden Eagle lands at, or less than, 30 M.P.H., flies “hands off” for long stretches and possesses the rare ability of automatically banking with the use of the rudder only. (When the rudder is returned to neutral the wings automatically resume normal flying position.)

And every prospective plane purchaser will be interested in the fact that *the Golden Eagle's average operating cost does not exceed \$1.25 per hour.*

[ *There are some valuable franchises open, offering special discounts to dealers and distributors. Write us immediately—probably your territory is still open.* ]

# R. O. BONE CO.

415 Industrial Avenue  
Inglewood, Calif.



*(California Notes continued)***Galt**

**G**ALT UNION HIGH SCHOOL field is located in the city limits of Galt, in the northeast part of town.

Two live wire aviation instructors have made the Galt Union High School known throughout the nation as the first school to give a complete course in the construction, flying, and maintenance of airplanes. G. N. Dobson is the shop instructor, and Capt. Le Roy Gregg is flight instructor. They have a class of 67 students.

Galt school has a licensed radio station, a Government weather bureau, an 8,000,000 candlepower beacon, landing lights, a wind velocity indicator, a wind pennant, four-way 60-acre landing field, a woodworking shop, hangars, two Eaglerocks, one American Eagle, one Jenny, one Martin monoplane, one Standard and one International; also eight engines, a large assortment of propellers, instruments and airplane and engine parts.

**Modesto**

**M**ODESTO MUNICIPAL AIRPORT, located in the southwestern part of the city, is managed by the two Penfield brothers. They have one small hangar, one lighted wind pennant, and an all-year runway.

They conduct a commercial flying service with Eaglerock planes, which includes flights over Yosemite Valley.

Ted Bent is flying his TM, and Ray Johnson of Manteca has his American Eagle at Modesto.

**IDAHO AIR NEWS**

By IDA M. DURNIN

**T**HE landing field at Dubois was formally dedicated recently. It will be used a great deal during the park season by planes serving the national parks in passenger service.

**I**MPROVEMENTS under way at the Mountain Home Airport include a beacon, a house and other buildings, a runway and installation of landing lights. Land for the airport was given to the village by the Mountain Home Exchange Club.

**W**ITH the reorganization of the Boise Flying Service, that city will have one of the largest commercial airports in the Northwest. The company plans to operate five commercial and training planes.

An air taxi business and an aviation school, using the Rankin system of instruction, will be conducted. The company has secured the distributing agency in Idaho for the Monocoupe plane.

The officers are: G. L. Olson, president; D. E. Grafe, vice president; Scott Anderson, chairman of the board of directors; Harry M. Hawthorne, Elmer C. Johnson, J. R. Cornell, and F. R. Colthorp, members of the board; C. L. Bennet, manager and mechanical supervisor, and Russel Owen, chief pilot instructor.

Construction of classrooms, adjoining the company's hangars, will begin immediately.

**COLORADO AIR NEWS**

**C**ONSTRUCTION work has started on the new administration building of the Alexander Aircraft Company at Colorado Springs. Measuring 250 by 50 feet, the building will be a two-story structure of Spanish design. Besides the administration building, four smaller structures will be erected on the 525-acre tract this spring.

**T**HE \$300 prize and free trip to the Eaglerock distributors convention in Colorado Springs was won by the Aero Corporation of California. Willis Kysor of Niles, Mich., won the second prize, \$200 and a free trip. Others who won free trips were: J. S. Charles, Richmond, Va.; Rah Kuhl, South Bend, Ind.; Massachusetts Airways, Springfield, Mass.; and Rapid Airlines, Rapid City, S. D. The prizes were awarded on the basis of sales activities during 1928.

**H**AVING recently returned from Europe where he visited many of the large aircraft factories, Don Alexander, Jr., son of J. Don Alexander, president of the Alexander Aircraft Company of Colorado Springs, has again set out for foreign lands in the interest of promoting aircraft trade abroad. He will visit the Orient and southern Europe this winter and spring.

**C**OLONEL FRED CARDWAY of New York City has become associated with the Alexander Aircraft Company as vice president in charge of international affairs.

## Buy Miller Airplane Products for Your OX-5

**A**LL indications point to 1929 as being the largest year in commercial aviation to date. The efficiency of your equipment is essential to profitable operation when the season opens.

Your motor's efficiency can be greatly improved by the use of the following:

"Rev's for OX's," by Leslie C. Miller, covers methods of improving power, reliability, and economy, price \$1.00.

Miller Overhead Assembly, outlasts original overheads many times.

Miller Roller Rocker Arms save the valve guides.

Miller Intake Valve Controls increase revs and save gas.

Miller Valve Guides and Seats put the cylinders back in service.

Miller 3 Ring, Medium High-compression Pistons increase power.

Miller Valve Guide Jig, for replacing guides in your own shop.

Miller Valve Seat Set, in conjunction with the Guide Jig, replaces the seats.

Miller Reamer Sets, etc., are indispensable when grinding valves.

We also sell numerous other necessities, including the German Bosch Magneto, Bosch Spark Plugs, Bosch Ignition Cable, and last but not least, the Bosch Breaker Assembly, to fit Berling Magnetos.

Write or wire to us direct or to any of our representatives for descriptive folder and price list.

## MILLER AIRPLANE PRODUCTS

**DISTRIBUTORS**

Logan Aviation Co.,  
716 West Superior Ave.,  
Cleveland, Ohio.

Johnson Airplane & Supply Co.,  
Dayton, Ohio.

3827 West Jefferson St.  
Los Angeles, California

Phone Empire 3570

**DISTRIBUTORS**

Nicholas-Beazley Airplane Co.,  
Inc.,  
Marshall, Missouri.  
Robertson Aircraft Corp.,  
Anglum, Missouri.

TRAINED  
MEN

WANTED

IN  
AVIATION



## Equipment Tells the Tale

Aviation is growing so rapidly that the question of equipment for a complete aeronautical course is one which prohibits the small school, on account of cost, from training the student along the most modern lines.

Owing to our affiliations with THE CRAWFORD AIRPLANE SUPPLY CO., the largest airplane jobbers in the world, our school equipment is the finest obtainable.

**Types of Motors Available**  
OX-5, OX-6, Hisso, Liberty, Wright, Velie, Hallet, Anzani and many others.

**Airplane Construction**  
All types wood and steel fuselages, wings, struts, fittings, etc. All steel construction featured. metal and welding courses.

**Ignition and Carburetion**  
Berling, Dixie, Scintilla, Le-Rhone, Splittdorff, Stromberg, NAD-L-S-T-Y and others.

Which, with the finest corps of instructors obtainable, guarantee training of the highest type.

**Our Flying Field:** Our flying instruction will be given on Clover Field, the largest government leased field on the Pacific Coast—the home of the world famous DOUGLAS plant, builders of airplanes for the government.

Within a radius of fifty miles of our schools are located 49 flying fields, fourteen airplane factories; and within a radius of one hundred and fifty miles, are located 35% of the entire aeronautical activities of the United States, according to Dept. of Commerce reports.

SEND THE COUPON FOR OUR CATALOGUE

**Crawford Aeronautical Schools**  
VENICE, CALIF.

We follow very closely the army system of training and conform in every way to the Dept. of Commerce rules and regulations.

Come to California and take your training to fit yourself for your place in the fastest growing industry of the age.

CRAWFORD AERONAUTICAL SCHOOLS  
Venice, Calif.

Mail me copy of your catalogue.

Name .....

Address .....  
AD 1



## CONTACTS

By FRANK E. SAMUELS

**S**OUTHERN CALIFORNIA is surely starting the new year, aeronautically speaking, with a bang. Big aeronautical mergers and consolidations have startled the world, flight records have been broken, transportation and air mail lines are breaking all carrying records, and student instruction is at its highest point.

I had the pleasure of seeing the two main record-breaking events. First the *Question Mark* in its refueling endurance flight, and the little Golden Eagle in which Bobbie Trout set a new sustained flight record for women. Both events took off and finished at the Los Angeles Metropolitan Airport.

**S**PEAKING of Bobbie Trout,—there is a young woman who deserves a lot of credit. Without any advance preparations, in a stock model Golden Eagle with only an extra fifty-gallon tank of gasoline in the front cockpit, she set a mark of twelve hours and fifteen minutes of sustained flight. Stepping into the plane at daylight, she flew continuously around the Metropolitan Airport until two hours after dark that night (7:15 p.m.), when, with less than a gallon of gas in the tanks, she made a perfect landing.

Our next thrill probably will be an endurance flight contest between Bobbie and Viola Gentry, of Roosevelt Field, Long Island, for Miss Gentry challenged Bobbie at the conclusion of the flight.

**A**NOTHER event which I was privileged in seeing was the first test flight of the low-wing cabin monoplane, The Scout, at the Eddie Martin Airport at Santa Ana. I had watched the construction of this plane since it was first laid down in a shop at Fullerton, Calif. It was designed and built for the Johnson-Webb Company of Los Angeles by M. C. Tunison, an old time Army airplane designer, and it has many novel features. It is built along the lines of the Junkers monoplane, is streamlined completely, even to the landing gear and wheels, which are encased close to the ground. That prince of test pilots, Jimmie Angel, flew it on its initial flight, and as he said on alighting, "It handles perfectly in the air and is very fast." This, the first of a proposed series, was motored with an Hispano engine, which apparently furnished plenty of reserve power for the little plane.

**H**ERE is a letter from Carl Spatz, commander of the *Question Mark* that should interest pilots flying over Southern California—

*On board the Question Mark  
over Southern California*

*January 6th, 1929*

*Sixth day of flight, 9:32 a.m.*

*Metropolitan Airport*

*Mr. Waldo Waterman*

*My dear Waterman:*

*The motors are beginning to labor, and it is only a question of time until we shall use your landing area. The night lights have*

*been excellent. It has given us confidence to know an excellent airport was beneath us in case of a forced landing. While still in the air the crew want to thank you for the untiring effort you have made and the assistance you have been to us.*

*Sincerely,*

*Carl Spatz.*

**S**PILLANE & COMPANY announces the opening of its branch store at the Municipal Airport, Oakland, where a full line of aero supplies is to be carried. Supply depots on large flying fields is a new idea for California and one that is meeting with the approval of pilots and owners of planes, for it does away with many long trips from the airports to the main stores of aero supplies in the different cities. Other aero supply firms that have opened or are opening branch stores at the airports in this territory are the Crawford Airplane Supply Company of Venice, with a branch store at the Long Beach Municipal Airport, and the Pacific Aeromotive Corporation of Los Angeles, which will locate at the L. A. Metropolitan Airport. The Aero Corporation of California has for some time had a supply station at its airport.

**T**HE Kinner Airplane & Motor Corporation is moving into its new factory in Glendale, which is situated nearly two miles nearer the business section of Los Angeles than the old site. For the present the company will retain its old factory, using it as a service station. It is connected with the new Air Terminal Airport, which enables them to test flight their motors from their own door. The new factory has many conveniences not enjoyed by the old one—the two principal ones being a railroad siding close to its doors and plenty of floor space for expansion. New machinery is being installed and production basis is now well under way, with orders enough ahead to warrant it.

**T**HE T. C. Ryan Flying School at San Diego has secured the services of S. E. Robbins as chief instructor for the flying school. Mr. Robbins, who is widely and favorably known in Army and civilian aviation circles, is an old timer who has been flying for eleven years, specializing as an instructor during this entire period. He was trained at March Field, Riverside, Calif., in 1917; received his advance training at Rockwell Field, San Diego, and in 1918 was Army flight instructor at March Field and later advance instructor on DeHavilland planes. He now holds a reserve commission and a Department of Commerce air transport license.

**F**OR rapid and efficient moving of an airplane manufacturing plant, we feel certain that the Bach Aircraft Company has set a mark hard to equal. January 12th the first load of machinery left the old plant at Venice, Calif., and on Monday morning, when the whistle blew, all machinery was connected up in the first unit of the new fireproof plant at the Metropolitan Airport,

Van Nuys, and the employees of all departments continued the work where they had left off at Venice. Three of the large planes, in different stages of construction, were trucked across country, along with all materials, jigs, parts, etc., necessary for the continuance of the schedule.

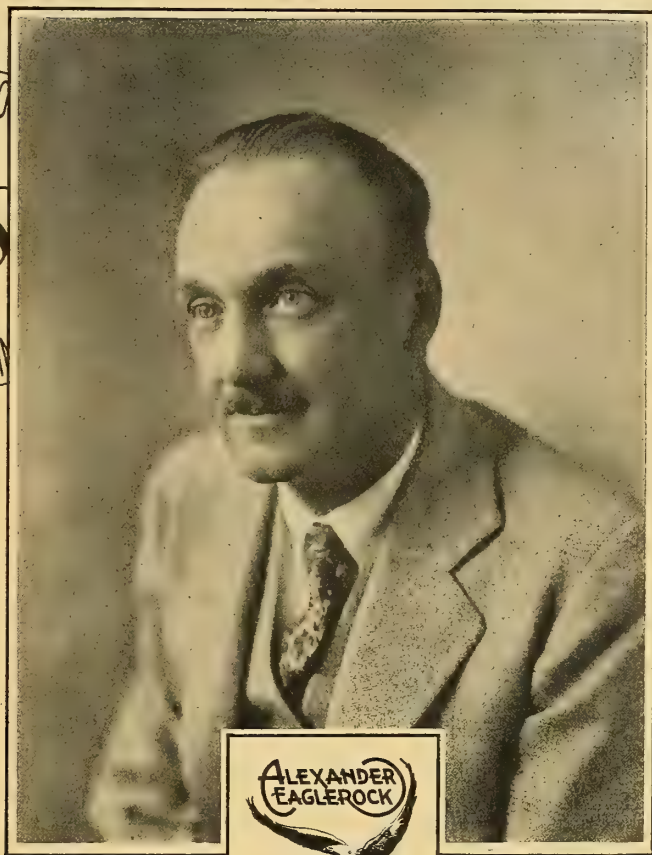
The new building is the last word in an airplane manufacturing plant. It is situated on the company's five-acre tract, and has, including the mezzanine, a floor space of 30,000 square feet. The second unit of the plant is already under construction and will be known as the mill unit. The Bach company contemplates cutting and drying all lumber used in the construction of its planes. The paint shop is a separate building and is already in use. A Southern Pacific railroad siding will be built, and all indications point to a greatly increased production of the Bach Air Yachts and Air Transports for 1929.

**T**HE first distributor's contract since the Fokker Aircraft Corporation came under the control of Harris M. Hanshue, James A. Talbot and associates, has been let, according to an announcement by Mr. Hanshue, who is president and general manager. The contract was made with the Aero Corporation of California, Inc., of which Jack Frye is president. It covers sales of the Universal and Super-Universal models in California and Arizona. Mr. Frye's company has been handling Fokker airplanes as a dealer for the last two years. Under the new contract Aero Corporation will, as occasion requires, appoint dealers in the two states.

By the way, former Postmaster General Frank H. Hitchcock is now on the board of directors of the Aero Corporation. Such a connection means a great deal, not only to the Aero Corporation, but to the entire aeronautical industry.

**T**HEODORE T. HULL, head of the American Aircraft Corporation and West Coast distributor of Waco planes, informs me that he has just closed a contract with the Advance Aircraft Company by which his firm has taken over the distributorship of Waco planes for the entire Republic of Mexico. The first delivery into Mexico has been made, and a number of other orders have been taken for immediate delivery.

**T**HE first 1929 all-aeronautical banquet and open meeting of the Southern California Chapter of the National Aeronautic Association was held at the Los Angeles Chamber of Commerce banquet hall, January 14th. Over four hundred aeronautical enthusiasts were present. The theme of this meeting was Air Transportation, and representatives of the leading transportation companies spoke on the subject. The principal speaker was Col. Paul Henderson, general manager of the Transcontinental Air Transport. These meetings are to be held monthly, each meeting to be devoted to a different branch of the industry. The theme of the February meeting is to be Navigation and Flight Instruments.



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## ARIZONA AIR NEWS

By HAROLD G. WILSON

**R**APID but conservative growth, is the way Kirke T. Moore, chairman of the state aviation committee, characterizes the growth of aviation in the state for the past year. The report was made to the aviation committee of the Pacific Coast Transportation Board, of which Mr. Moore is Arizona vice chairman.

"Traffic over the Model Army Airways," he states, "which crosses southern Arizona, has increased to the point where more than one hundred planes from out of the state of Arizona were serviced at the two Tucson fields during each of the months of June, July and August. In September, due to the National Air Races, the traffic increased to 286 planes. Later months in the year showed the regular normal increase."

The report reviews progress in various parts of the state. Special attention is given the leasing policy of the city council, Tucson, which has adopted plans to encourage commercial aviation by leasing, at a nominal sum, tracts of land on its 1280-acre municipal field. Three tracts have already been taken and others have been requested.

Two airports in the state, those at Douglas and Tucson, now have night lighting equipment, and plans are now under way for night illumination of two fields at Phoenix,—the municipal airport and that of Scenic Airways, Inc.

Airports opened during the year include those at Douglas, Prescott, Yuma, Chandler,

Willcox, Flagstaff, Winslow, Grand Canyon, Clifton, Kingman, Holbrook and two at Phoenix, making four fields for the state capital. Other fields are being planned for Clifton, Casa Grande, Florence, Globe, Chloride and Tempe. Temporary landing fields were also established at a number of guest ranches.

Radio and meteorological stations were established at Tucson during 1928, and similar stations have been promised Yuma, both on the Model Army Airway. Perhaps the greatest expansion of the present year will be that of the Scenic Airways, Inc., which now have fields at Grand Canyon, Phoenix and El Paso. Plans are under way to spend \$150,000 on the Phoenix airport, and to lease a tract on the Tucson municipal field. Fifteen ships have been budgeted for this company for the year.

Air schools are operating in several cities of the state, Phoenix having two, Tucson three and Nogales one. Tentative plans are under way for a new school at Douglas. Of these, the Mayse Air School, Tucson, turned out the largest number of graduates during the year 1928.

**A**NOTHER transcontinental air route has been mapped out across Arizona, according to a report received by the Arizona Industrial Congress, Phoenix, from Western Air Express, Inc. In the spring they plan to launch a new transcontinental line from Los Angeles to some point in Missouri, where they will connect with lines into Chicago and eastern points.

**T**ENTATIVE plans for an airline from Los Angeles through Arizona to Mexico City were announced recently by Capt. Daniel Eric Ellis, while in the state for a survey trip. King C. Gillette, razor magnate; Arthur and O. B. English of the U. S. Gypsum Corporation; James B. Rice, well-known hunter and explorer; and Lee C. Balch, first president of the Mercantile National Bank of Mexico City, are backers of the enterprise. Trimotored Bach planes, powered with Pratt and Whitney engines, are to be used for the line. Daily service, with light sandwich service en route, is the ultimate goal. Landings are contemplated for Phoenix, Tucson and Nogales in Arizona. Guaymas, Mazatlan and Guadalajara are division points selected for the west coast of Mexico.

**T**O facilitate travel to Chloride, small mining camp of the Arizona Magma Mining Company, directors have authorized the establishment of an airport there at company expense. Announcement of the plan was recently made in Phoenix by Cliff Carpenter, president. From Phoenix, Chloride is but an hour and a half's time away by plane, but a day's journey by automobile.

**A**PPPOINTMENT of Charles W. Mayse, Tucson, president of the Mayse Air School, as Arizona and northern Mexico agent for Ryan planes was recently announced by the Mahoney Aircraft Company of St. Louis, Missouri.

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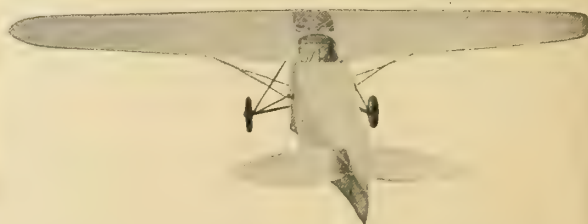
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## NORTHWEST AIR NEWS

By F. K. HASKELL

A TRAFFIC arrangement of railroads, airplanes and Yellow cabs for providing speedier transportation both in Spokane and cross-country, is planned by the Yellow Air Lines, just formed to take over the ships, hangar and equipment of Spokane Airways on Felts Field.

George C. Nichols will be president and general manager; A. H. Wenck, a director, and A. E. Rice, secretary-treasurer.

C. H. Griffin, western sales manager for the Curtiss Flying Service, who is aiding in the formation of the Yellow Air Lines, states that the Curtiss Flying Service will cooperate with the new service.

The activities of the Yellow Air Lines will include mail and passenger service, sightseeing flights, cross-country charter service and aerial photography. Spokane will become the distributing point in the Northwest for the Curtiss Robin, equipped with an OX-5 90 h.p., engine, and the Challenger Robin equipped with a 170 h.p., air-cooled radial engine.

PORTLAND AIRPLANE CORPORATION has been formed at Portland, Ore., by K. Miller, E. H. Mason and A. G. Fletcher, who will engage in a general airplane business.

L. E. THERKELSEN, governor of Oregon of the National Aeronautic Association, was chosen president of the Aero

Club of Oregon for the coming year at the annual election. Kenneth S. Jordan was elected vice president, and M. F. Wright was named secretary. Leland G. Bennett was elected treasurer. Directors named were L. L. Adcox, A. B. MacKenzie, S. V. W. Peters, Tex Rankin and B. B. Smith.

SUNDAY sightseeing trips around Mt. Hood are becoming popular. These trips are in the West Coast Air Transport Company's trimotor planes which carry eight passengers. Pilots Al French and Bob Saute operate the planes, and usually fly at a 13,500-foot level, which gives the passengers a magnificent view of the country.

## WASHINGTON AIR NEWS

By C. M. LITTELJOHN

THE Colfax Aviation Company has been incorporated at Colfax. Incorporators of this company are L. L. Bruning, Simon Driefus, Harvey Lee, R. F. Bigelow, and Warren J. Cram.

A NEW airplane manufacturing concern which was established recently in Spokane is the United States Aircraft Company.

A GOOD-WILL air tour of the entire state of Washington is planned by the Aviation Operators' Association of Seattle, to create greater interest in airport development throughout the State of Washington.

SEVERAL air committees are expected to be appointed by the state legislature now convening at Olympia. Problems within the state which necessitate legislative air committees include the tax on aviation gasoline, a state aeronautics code now being drafted by a committee headed by Charles Allen, and the establishment of airports and emergency landing fields.

A NEW sports model plane, No. 81A, is being turned out of the Boeing factory at Seattle. It is equipped with an Axelson motor, and in the trials made 110 miles an hour and cruised at ninety miles.

A NEW \$150,000 air terminal has been designed by the Austin Company for the municipal airport at Seattle. The new passenger terminal will contain spacious passenger waiting rooms, a ticket office, bulletin boards, a telegraph station, concrete aprons leading to and from loading sheds nearby, and space for taxicab service to the port.

A NEW airplane factory for Seattle has recently been projected by George H. Storck. Mr. Storck is gathering together a number of technical men and is perfecting details of the organization. The company will turn out small land and seaplanes.

APRIL first is the date set for opening of the Union Air Line's air transport line from Juneau, Alaska, to Los Angeles, Calif., with Seattle as its headquarters.



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## UTAH AIR NEWS

By GLEN PERRINS

**G**REAT strides have been made in aviation in Salt Lake in the past year. Today there is an investment of close to \$150,000 in hangars alone at the airport. The hangars house fifty ships, which means a personnel of more than 100 men.

**W**ESTERN AIR EXPRESS is building a large hangar which will be ready for service in the near future. A twelve-passenger trimotor Fokker plane arrived in Salt Lake January 3rd and will offer a de luxe service between Salt Lake and Los Angeles four days a week. H. J. Merchant, district passenger agent, announced. Three more planes will be used on this service soon.

**O**PERATING the most mileage of any single company in the nation, the Boeing Air Transport, Inc., with Salt Lake as headquarters, stands out among air transport flashes of progress in 1928. The Boeing company has taken over the Government hangar and has also built what is now the largest hangar in the West. The Boeing line carries the greatest poundage of any line—around 2,500 pounds.

Air mail service east and west from Salt Lake will be operated on a 12-hour schedule, instead of every 24 hours, beginning in the spring. Boeing Air Transport is planning to place 10 new type airplanes, designed to carry only mail and express, on its trans-continental route through Salt Lake.

**"T**HE baby line," the National Parks Airways, started flying from Salt Lake to Great Falls in August. Planes stop at Ogden, Pocatello, Butte and Helena. Four six-passenger Super-Universal Fokker planes are used. The line approximates 500 miles in length and is flown daily, with ever increasing patronage.

**T**HE Walter T. Varney air mail line operating between Salt Lake and Seattle, via Boise and Pasco, is increasing its loads and is growing steadily. Average monthly poundage is around 16,000.

## OREGON AIR NEWS

By C. K. LOGAN

**A**IRPORT construction in Oregon will proceed as planned since the state supreme court recently upheld the validity of municipal bonds voted for this purpose. Medford, Salem and Roseburg will spend a total of \$185,000 for this purpose.

The Medford airport must be completed by June 1, when the night schedule of the air mail will be inaugurated along the coast. Standard requirements of the Government for illuminated landing fields will be met. The airport site is three miles from the center of the business district and will be one mile long and half a mile wide, enabling planes to land in any direction. The main runways will be hard surfaced. The city will erect one hangar. Other equipment will include buildings by the Pacific Air Transport Company and air passenger lines. An

administration building will house Department of Commerce officials and the weather bureau. Department of Commerce radio towers, 128 feet high, will be located half a mile from the airport. Plans are now going forward for the \$110,000 bond issue for the field.

Having voted \$50,000 for this purpose last spring, Salem will ask permission of the 1929 legislature, now in session, to purchase state land suitable for an airport.

Roseburg will spend \$25,000 on its airport.

**J**AMES COOPER and Kenneth Rodgers, graduates of the Rankin Flying School in Portland, are now in charge of ground instruction and students at the Eyerly Aeronautical School, formerly the Pacific Airplane Service, in Salem. W. A. (Scout) Hazelwood is chief pilot and instructor.

**T**HE Aircraft Builders' Corporation, a newly incorporated concern which will manufacture planes, plans to erect in the near future a factory at Eugene. This plant, which eventually will employ about 100 men, is expected to be complete and ready for production next summer.

According to present plans, the company will build two types of ships, a two-place training biplane and a three-place low wing monoplane.

George E. Love is president of the corporation; F. L. Chambers, vice president; E. S. Goodin, secretary-treasurer; J. Kegerreis, managing director; and Lieut. B. B. Smith, aeronautical engineer.

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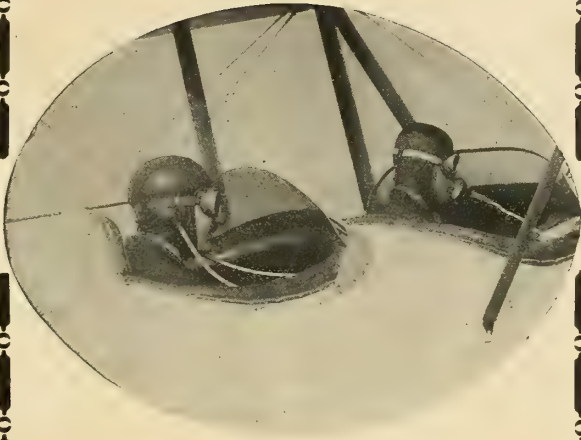
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# THE TRAINING OF STUDENT PILOTS

By T. Claude Ryan

*President, T. C. Ryan Flying School*

**M**OST of the airlines, air service companies, and commercial operators of planes are profiting by the experience of the U. S. Air Corps by appointing, for positions of responsibility, men with intimate aeronautical experience. The difficulty is that there are not enough men available with flying experience and all-around aeronautical knowledge.

The supply of active pilots with sufficient training experience is also very limited—that is, pilots for commercial airlines, aerial service work, air mapping, flying instruction, or pilots for planes owned by general business organizations or individuals. The demand for experienced pilots has been so great that many of the smaller airline operators have had difficulty in retaining their pilots.

Colonel Lindbergh pointed out that one of the gravest problems facing the advance of aviation is that of personnel. Flying is safe today, but it must be combined with training and experience. We have not yet reached the stage in the development of aircraft where the pilot plays a minor part in the operation of an airplane and, until we progress to that stage, it is essential to have trained and experienced operators if we are to have safe flying. There are many schools which advertise that they will teach a novice how to fly an airplane and which turn out the student as a finished pilot after only ten hours in the air. Ten hours of flying will not make anyone a pilot. A great many serious aviation accidents occur because of pilots who are turned out of cheap schools without sufficient experience to meet emergencies.

A good airplane pilot's course should include a minimum of sixty hour's flying, approximately fifty of which should be solo. These are the requirements of the Department of Commerce for the training of a Limited Commercial Pilot. The type of training and flying experience that the student has during these hours in the air is extremely important. Every minute in the air should be devoted to practice on particular kinds of flying as directed by an expert instructor, either in the air during dual in-

struction or on the ground before each solo period. There are many things to know about flying, many knacks, many bits of knowledge, the accumulation of which, together with well developed judgment, goes to make the expert pilot. These all can be mastered in a good course of flying with an instructor who gives his student the results of his own training in addition to his accumulated experience of years of flying.

As an example of the importance of adequate instruction and care in giving every single point in airplane piloting, it has been the writer's experience that, in cross-country flying where it is necessary to use small and difficult fields, more crashes occur as a result of the inability of many pilots to execute proper landings in a stiff cross-wind than from any other one cause. Many pilots who have been flying for years, and who are in most respects competent, do not know how to make a proper cross-wind landing. Cross-wind landings require considerable practice, must be understood thoroughly and executed exactly right, but when once mastered can be made with consistent ease even in winds of high velocity.

For dual instruction, it is generally recognized that the Gosport speaking-tube system is the most efficient means of communication between student and instructor. It has been found that students solo in less time when this system is used. This system of communication has also proved very valuable in advanced instruction. In instructing a student on an advanced maneuver, being able to talk to him when demonstrating and letting him follow on the controls is a big advantage. The instructor can also criticize the student's errors at the moment such errors are made.

A course which gives training with the object of qualifying its student pilots for Limited Commercial Pilot's licenses should include training in more than one type of airplane—the more types the better. Instruction in piloting open and closed types, large and small of both varieties, is de-

sirable to be included in the course.

The course should include sufficient experience on spot landings from various altitudes and positions in relation to the field to insure the student's proficiency in this. Considerable practice is important on stipulated forced landings where the instructor cuts motor and makes the student pick a field and land.

Sufficient instruction and practice on all ordinary acrobatic maneuvers should be given so that the student can properly execute each maneuver solo. Even before the first solo, practice should be given on going in and out of tail spins. Figure eights are considered good practice, following solo landings. They give practice in handling the ship properly in the air, and in addition require consideration of fixed points on the ground.

Cross-country flying should be included as an important and extensive part of the course. Numerous trips should be made, and a variety of fields landed in at different points. Students should lay out their own courses on their maps and fly by compass, doing their own navigating. Long trips are not necessary, since the same principles are involved in trips of from twenty to fifty miles as in trips of several hundred. More can be learned per hour on short trips.

The use of the bank and turn indicator, and practice in flying completely blind by use of instruments should be included as a part of training in modern flying schools. This is done by hooding the rear cockpit and letting the instructor accompany in the front cockpit with dual controls.

Many flying schools are weak in ground training. Their courses often consist of nothing more than a few lectures by the mechanics of their shops. For small schools, of course, it is difficult to provide the necessary facilities for sound ground training on the technical subjects of aviation. That thorough training in these subjects is necessary for the complete airman is borne out by the Department of Commerce in its requirements for the Limited Commercial Pilot's license. Training of real merit can be given only by instructors who are especially qualified to instruct in certain subjects. Quite a staff of high grade instructors is required properly to expound thorough technical ground training in aviation. Classrooms, shops and laboratories with extensive equipment are necessary for an institution giving the type of ground training which really qualifies its students. As an example, navigation requires an exceptional type of instructor—one preferably with sea and air experience in practical navigation, as well as experience in instruction.

The above are a few of the high points which should be included in a thorough flying course. A course such as that briefly outlined in the foregoing paragraphs, if given by a flying school thoroughly equipped and under the direction of those experienced and skilled in the science of aeronautical training, should produce from any reasonably apt student a competent and safe pilot.



Ryan Flying School, San Diego, California

THE "SPIRIT OF ST. LOUIS".... A RYAN PRODUCT!

It means something to be a

# RYAN GRADUATE

This scene is not an "Air Meet!" It is an actual photograph of a part of the flying equipment used by the T. C. Ryan Flying School. Note the large variety of modern licensed planes in which students receive flying experience.

## Ryan Graduates Are Expert Pilots . . . Expert Pilots Are in Demand

There's a vast difference in aviation training. Investigate thoroly. Be sure you get the best. Hundreds of so-called flying "schools" claim they can turn out finished pilots in 10 hours' flying time. We tell you frankly—it CANNOT be done. A really competent pilot for commercial flying cannot be trained with less than 60 hours in the air and four months' ground training; a safe pilot for private flying cannot be produced with less than 20 hours in the air and two months' ground training.

Aviation experts will tell you that the T. C. Ryan Flying School at San Diego, California, is offering two of the finest flying courses in America. Ryan students—because of long, thro training under ideal flying conditions, competent staff of licensed instructors and many types of licensed planes—are better qualified to fill the important flying and executive positions which are opening up on every hand.

### MID-WINTER CLASSES NOW ENROLLING

Take Advantage Now of R.R. "Mid-winter Excursion Rates" to San Diego

No delays! Every day is a flying day in San Diego—the charming city on the edge of the blue Pacific. San Diego knows no winter, no sleet or slush or snow, no freezing temperatures, no high winds or serious storms. That's why two great U. S. Government flying schools and many other aviation activities are active here—every day in the year. Resolve to become a part of this fascinating activity NOW.

**NOTE:** T. Claude Ryan, pioneer of aviation for 12 years, is the original designer and builder of Ryan monoplanes. Under his supervision Col. Lindbergh's "Spirit of St. Louis" was constructed. Mr. Ryan is the founder of Ryan Airlines, Ryan Flying Co., T. C. Ryan Flying School and T. C. Ryan Aeronautical Corp.

TYPICAL  
WINTER  
SCENES

in **San Diego**  
California  
*"Air Capital of the West"*

RYAN  
STUDENTS IN  
FORMATION  
FLIGHT

#### IF INTERESTED IN QUALITY TRAINING—YOU ARE INVITED TO SEND FOR CATALOG

The T. C. Ryan School specializes in a complete course covering four full months—with 60 hours in the air and thoro ground training—qualifying you for a Commercial License.

Also a Private Operator's course, covering two months—with 20 hours in the air and primary ground training. Also Advanced Work for those who have had previous training.

T. C. RYAN FLYING SCHOOL, Dept. C, Ryan Airport, San Diego, Calif.  
(A Subsidiary of the T. C. Ryan Aeronautical Corporation)

Gentlemen: I am interested in your course of flying instruction. Please send me your catalog.

Age.....

Name..... Address.....

Learn  
to fly  
with  
**RYAN**  
at the  
**T. C. RYAN**  
**FLYING**  
**SCHOOL**



## "Chutes" for Safety



**No San Diego Air Service Corporation student pilot ever leaves the ground without his Russell Lobe Parachute. These parachutes, standard flight equipment, provide a factor of safety previously available only to Army and Navy pilots. The preeminent safety of *Air Service Training* is further guaranteed by use of new Warner and Wright Whirlwind powered Travel Air Biplanes. Complete information awaits your request.**

**SAN DIEGO AIR SERVICE CORPORATION**

**Lindbergh Field**

**San Diego, California**

# ....Congratulations

## To the San Diego Air Service Corporation



Your progressive training methods have always entitled you to recognition as one of the nation's outstanding Aviation Schools. We are pleased indeed to learn that your enrollments increased 500% in 15 days when you adopted Russell 'Lobe' Parachutes as standard equipment for training purposes.

**THE Russell "Lobe" Parachute** has a record of 100% efficiency in use. This is due to superior materials and workmanship--but, most of all, to simplicity of design and ease of operation. In an emergency you simply pull the release ring and the Parachute does the rest. No springs, no rubber bands, no pilot chute--nothing to get out of order. NAME OF NEAREST DEALER AND DESCRIPTIVE FOLDER ON REQUEST.

**DEALERS:** Ask about our new Dealer Franchise with liberal discounts and no quota requirements.

**RUSSELL PARACHUTE COMPANY**

1202 KETTNER BLVD.

SAN DIEGO, CALIF.



# AERONAUTICAL INDUSTRY

## THE INDUSTRY'S PART IN THE FLIGHT OF THE "QUESTION MARK"

Richfield Oil Powered the "Question Mark"

CLIMAXING a series of successful participations in internationally famous aviation accomplishments, the Richfield Oil Company, Pacific Coast manufacturer of aviation gasoline, had a part in the record-smashing endurance flight of the Army *Question Mark*.

It was Richfield gasoline—some 5,250 gallons, valued at more than \$1,000—which exclusively powered the ship, according to an announcement made by Dudley Steele, head of the aviation department for the oil company. Steele was chairman of the Contest Board for the National Aeronautic Association at the last National Air Races.

Following the flight finish, members of the crew of the question-answering "Interrogation Point" trimotored Fokker, together with members of the crews of the big Army Douglas ships which performed the aerial refueling, were guests at a banquet given by Richfield at the Hotel Biltmore, Los Angeles. It was the oil company, too, which sponsored the KFI hour broadcast in which Flight Commander Spatz described the record-breaking test.

Richfield gasoline had already won distinction, having been chosen by Captain Wilkins for his North Polar flight, and used by Art Goebel on his successful and record-setting non-stop transcontinental flight in the *Yamkee Doodle*. It was also used by many of the winners of the National Air Races.

### Lubrication of the "Question Mark"

"THERE is no question but that the amazing endurance record of the giant Army trimotored Fokker plane, *Question Mark*, was the hardest test ever given a motor oil, and we take pride in the fact that Pennzoil, which lubricated the three Wright Whirlwind engines, turned in a record of perfect performance that was second only to the performance of the ship itself," said Norman M. Day, vice president and general sales manager of the Pennzoil Company.

"The failure of the auxiliary greasing system is to be regretted. It consisted of grease lines leading to each cylinder on each motor through which grease was to be forced to rocker arm bushings and tappets at regular intervals, it being impossible to grease these points satisfactorily while the plane was in the air. During the course of the flight these lines became plugged up, with the result that some of the tappets received no lubrication whatever. That the great Wright Whirlwinds were able to function for over 150 hours in spite of this handicap is indeed a great testimonial to their efficiency.

"An examination of the motors after the flight revealed that all cylinders, pistons, bearings and points for the lubrication of which Pennzoil was responsible, were in exceptionally fine condition; in fact, the original oil was still in the ship after the flight, when it took off for San Diego. The oil screens were remarkably free from sludge and deposits of any kind. We are proud of Pennzoil's showing in this great flight and pleased that we are able to have a part in helping to make it successful."

### Thompson Valves in "Question Mark"

THE Thompson Products, Inc., of Cleveland, manufactured the valves used in the three Wright Whirlwind engines of the Fokker plane *Question Mark*, during its recent non-stop flight. Engineers of the company consider this the most severe test that could be given valves. It is estimated that each of the 54 valves opened and closed 6,700,000 times during the flight. Explosive pressure on the valve heads was about 250 pounds per square inch. The valves were of the cupped head, hollow stem type, with a special salt splash cooling arrangement.

### Haskelite Plywood on "Question Mark"

BALSA plywood of Haskelite manufacture was employed for the flooring of the *Question Mark*, record breaking endurance plane. Haskelite plywood was also used for the construction of the wing spars of this plane. Although the time the *Question Mark* was in the air is not so great when compared with the total life of an airplane, the heavy fogs and adverse conditions encountered by the big Fokker had absolutely no effect on the Haskelite.

## SIMPLIFIED TIME- CHART OF WORLD

THE second edition of the Simplified Time-Chart of the World, by Lieut. Charles M. Thomas has recently been issued. By use of the system worked out on this chart, one can determine the relative times at any and all places on the face of the earth.

Twenty-five horizontal lines in red are shown on the map, between which there are twenty-four spaces representing the hours of the day. Twenty-four vertical lines intersect the red lines. At the points of intersection, hour figures are shown in red. Diagonal lines across the map represent noon and midnight.

To determine the time it was at one place when an event took place at some distant locality, one need only refer to the given time on the vertical line running through the location where the event occurred and follow the horizontal line till he reaches the vertical line extending through the place of the unknown time. The unknown time will be indicated at this latter intersection of lines.

## CIVIL SERVICE EXAM.

THE United States Civil Service Commission announces the following open competitive examinations:

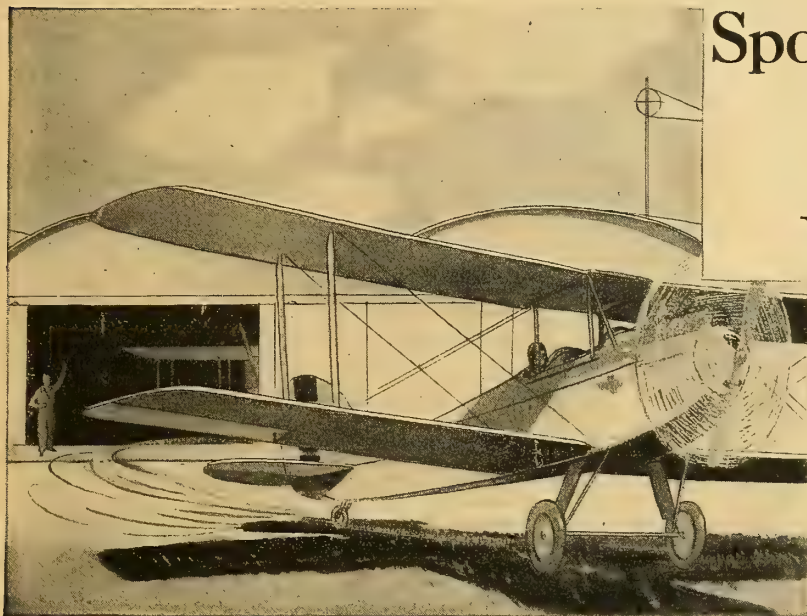
Associate Aeronautical Engineer.  
Assistant Aeronautical Engineer.

Applications for the positions must be on file with the Civil Service Commission at Washington, D. C., not later than February 20, 1929.



Part of the drums of gasoline that fueled the "Question Mark"

# Ground Maneuvers *are Simplified by this new*



Goodrich Sponge Rubber Tail Wheels permit you to do the things you have always wanted to do—easily, safely and independently

## Sponge Rubber TAIL WHEEL



Tail wheels eliminate the need for back strains and dollies

ON the newer models of airplanes you will see them—these *new* sponge rubber tail wheels that eliminate back strains and simplify ground maneuvers.

No longer is it necessary to pull and haul on a “plow” skid fuselage to get your plane out in the open. No longer is it necessary to “play wagon” with a dolly, or even ask for help in and out of the hangar.

You can push out of the hangar, turn corners and head up into the wind . . . *unaided*. With a Goodrich sponge rubber tail wheel your take off is quicker, better.

And your landing is safer, too, because the rubber tail wheel absorbs much of the plane's first shock.

**G**OODRICH has staked out its field in aviation. The realm of the heavier-than-air craft is its zone of endeavor. There Goodrich has pioneered . . . there Goodrich has helped write airplane history. And there Goodrich still flies with the leaders, with its products as far advanced over others as the modern airplane is advanced over the biplane of two decades ago.

In fact, you can now handle your plane on “ground maneuvers” much as you would your automobile.

Mobility; ease of handling; shock absorption; less landing stress on the fuselage; smoother taxiing, and less damage to the air field—*these* are the advantages of Goodrich Sponge Rubber Tail Wheels. Look for them on the newer air-

plane models.

THE B. F. GOODRICH RUBBER COMPANY, Akron, Ohio, Established 1870. Pacific Goodrich Rubber Company, Los Angeles, California. In Canada: Canadian Goodrich Rubber Company, Kitchener, Ontario.

# Goodrich Rubber for Airplanes



## AIRCRAFT HAVING APPROVED TYPE CERTIFICATES

(As of December 31, 1928)

Key: P—place; O—open; C—closed; L—landplane; Am—amphibian; Conv—convertible; Fb—flying boat;  
B—biplane; M—monoplane.

ATC No.	Date Issued	Aircraft	Weight Empty	Useful Load	Gross Weight
1927					
1	3/29	Buhl Airster 3POLB J4 200HP.....	1686	1383	3069
2	7/26	Boeing 40A (Mail) 3POLB Wasp 400HP.....	3531	2469	6000
3	3/29	Johnson Twin-60 2POLB 2 Bristol Cherubs 36HP.....	800	520	1320
4	6/8	Douglas O2 2POLB Liberty 12 400HP.....	2885	1870	4755
5	6/8	Douglas M2 3POLB Liberty 12 400HP.....	2885	1870	4755
6	6/8	Douglas M4 3POLB Liberty 12 400HP.....	3400	1455	4855
7	4/7	Alexander Com. Wing 3POLB OX5 90HP or OXX6 100HP.....	1470	760	2230
8	4/7	Alexander Long Wing 3POLB OX5 90HP or OXX6 100HP.....	1470	760	2230
9	6 17	Atlantic Universal 7PCConvM WW 200HP.....Landplane	2192	1808	4000
		(Hamilton Pontoons) Seaplane	2653	1347	4000
10	7 2	Fairchild FC2 5PCConvM WW 200HP.....Landplane	2160	1440	3600
		(Fairchild Pontoons) Seaplane	2427	1573	4000
11	7/19	Advance Waco-9 3POLB OX5 90HP or OXX6 100HP.....	1320	780	2100
12	9/27	Buhl Airster 3POLB J5 200HP.....	2072	1628	3700
13	10/6	Advance Waco-10 3POLB OX5 90HP or OXX6 100HP.....	1200	825	2025
14	10/6	Douglas C1 Transport 10POLB Liberty 12 400HP.....	3800	3600	7400
15		Cancelled			
16	11/1	Stinson SM1 6POLM J5 200HP.....	1970	1515	3485
17	11/10	American Eagle 3POLB OX5 90HP or OXX6 100HP.....	1227	814	2041
18	11/15	Pittairn PA5 1POLB J5 200HP.....	1742	1070	2812
19	12/1	Kreider-Reisner Challenger 3POLB OX5 90HP or OXX6 100HP.....	1236	764	2000
20	12/1	Fairchild FC2W 5PCConvM Wasp 400HP.....Landplane	2770	1830	4600
		(Fairchild Pontoons) Seaplane	2418	2182	4600
		Skiplane	3030	1570	4600
21	12/8	Swallow 3POLB OX5 90HP or OXX6 100HP.....	1447	753	2200
1928					
22	1/4	Central States Monocoque 2POLM Anzani 60-80HP.....Siemens 70HP	700	475	1175
		(Mono-Aircraft Co.)	749	426	1175
23	4/30	Boeing B1D 4PCFb WW 200HP.....	2588	1155	3743
24	1/6	Stinson SB1 5POLB J5 200HP.....	1815	1465	3280
25	1/27	Mahoney Ryan B1 5POLM J5 200HP.....	1870	1470	3340
26	2/8	Advance Waco-19 3POLB Siemens 90-125HP.....	1349	678	2025
27	2/25	Boeing 40B 3POLB Hornet 525HP.....	3506	2573	6079
28	3/12	Lincoln Page 1928 3POLB OX5 90HP or OXX6 100HP.....	1250	950	2200
29	4/2	National Airways Air King 3POLB OX5 90HP.....	1380	755	2135
30	3/22	Travel Air Model 2000 3POLB OX5 90HP or OXX6 100HP.....	1347	833	2180
31	3/22	Travel Air Model 3000 3POLB Hiss 150-180HP.....	1684	926	2590
32	3/22	Travel Air Model 4000 3POLB WW 200HP.....	1660	740	2400
33	4/3	Buhl CA5A 5POLB WW 200HP.....	2100	1690	3790
34	4/4	Loening 7PCAmB Wasp 400HP.....	3730	2170	5900
35	4/4	Internat'l B17 3POLB OX5 90HP or OXX6 100HP.....	1480	620	2100
36	4/7	Pheasant 3POLB OX5 90HP.....	1351	875	2026
37	4/11	Travel Air Model 8000 3POLB Caminez 120HP.....	1475	825	2300
38	4/11	Travel Air Model 9000 3POLB Ryan-Siemens 125HP.....	1475	825	2300
39	5/9	Berliner CM-4 3POLM OX5 90HP.....	1490	810	2300
40	5/28	Curtiss Robin 3POLM OX5 90HP.....	1489	728	2217
41	6/18	Advance Waco-10 3POLB WW 200HP.....	1411	899	2310
42	6/18	Advance Waco-10 3POLB Hiss 150-180HP.....	1508	896	2404
43	6/14	Simplex Red Arrow 2POLM Kinner 75HP.....	1020	572	1592
44	6/14	Simplex Red Arrow 2POLM Kinner 75HP.....	1020	572	1592
45	6/28	Texas Temple 1POLM WW 200HP.....	1350	900	2250
46	6/18	Buhl CA-3C 3POLB WW 200HP.....	1760	1440	3200
47	6/18	Bellanca CH 8POLM WW 200 HP.....	2190	1860	4050
48	8/28	Stinson SM-2 3POLM Warner 110HP.....	1516	984	2500
49	7/9	Lockheed Vega 5POLM WW 200HP.....	1875	1595	3470
50	7/9	Swallow 3POLB Hiss 150-180HP.....	1728	972	2700
51	7/9	Swallow 3POLB WW 200HP.....	1716	984	2700
52	7/9	Atlantic Super-Universal 7PCConvM Wasp 400HP.....Landplane	3000	2150	5150
		(Hamilton Pontoons) Seaplane	3550	1600	5150
53	7/14	Arkansas 3C3 Command-Aire 3POLB OX5 90HP or OXX6 100HP.....	1410	790	2200
54	7/14	Boeing 40C 5POLB Wasp 400HP.....	3522	2553	6075
55	7/27	Stearman C-3B 3POLB WW 200HP.....	1625	1025	2650
56	7/30	Atlantic FX 14POLM 3 Wasp @ 400HP.....	7390	5110	12500
57	8/6	Alexander A1 3POLB WW 200HP.....	1705	786	2491
58	8/6	Alexander A2 3POLB OX5 90HP or OXX6 100HP.....	1459	982	2441
59	8/6	Alexander A3 & A4 3POLB Hiss 150-180HP.....	1877	741	2618
60	8/8	Sikorsky S38A 1PCAmB 2 Wasp @ 400HP.....	6000	4480	10480
61	8/9	Fairchild FC2W2 5PCConvM Wasp 400HP.....Landplane	2732	2768	5500
		(Fairchild Pontoons) Seaplane	3072	2428	5500
62	8/15	Stearman C3C 3POLB Hiss 150-180HP.....	1790	1500	3290
63	8/15	Curtiss Robin 3POLM Challenger 170HP.....	1576	864	2440
64	8/24	Boeing B1E 4PCFb Wasp 400HP.....	2090	1510	3500
65	8/27	Cessna A 4POLM Anzani 120HP.....	1304	956	2260
66	8/27	Loening 5PCAmB Hornet 500HP.....	3867	2033	5900
67	8/27	Loening 6PCAmB Cyclone 500HP.....	3849	2051	5900
68	8/29	Curtiss-Robertson Robin 3POLM OX5 90HP.....	1489	728	2217
69	8/29	Curtiss-Robertson Robin 3POLM Challenger 170HP.....	1576	864	2440
70	9/5	Mono Aircraft Monocoque 2POLM Velle 45HP.....	795	535	1330
71	9/5	Spartan C-3 3POLB Ryan-Siemens 120HP.....	1355	795	2150
72	9/7	Cessna A-4 4POLM Warner 100HP.....	1225	1035	2260
73	10 12	Spartan C-3 3POLB Walter 120HP.....	1310	840	2150
74	10/16	Stinson SM-1DA 6POLM WW 200HP.....	2432	2068	4500
75	10/24	Fairchild FC2 5POLM Challenger 170HP.....	2239	1361	3600
76	10 29	Stinson SM-1DB 6POLM WW 200HP.....	2522	1978	4500
77	10 29	Stinson SM-1DC 2POLM WW 200HP.....	2514	1986	4500
78	10/29	Stinson SM-1DD 2POLM WW 200HP.....	2280	2220	4500
79	11/7	Consolidated PT-1 2POLB Wright-Hispano 150-180HP.....	1805	713	2518
80	11/7	Consolidated NY-1 2POLB WW 200HP.....	1773	722	2495
81	11/7	Consolidated NX-2 2PCConvB WW 200HP.....Landplane	1800	698	2498
		Seaplane	1881	842	2723
82	11/7	Consolidated O-17 2POLB WW 200HP.....	1747	698	2445
83	11/7	Consolidated PT-3 and PT-3A 2POLB WW 200HP.....	976	474	1450
84	11/10	Consolidated Model 14 2POLB Scarab 110HP.....	3342	2408	5750
85	11/13	Hamilton H-45 8POLM Wasp 400HP.....	1812	1038	2850
86	11/17	Laird LC-B 3POLB WW 200HP.....	6169	3961	10130
87	11/19	Ford 4-AT 14POLM 3 WW @ 200HP.....	1331	1069	2400
88	11/23	Kreider-Reisner Car 4 3POLB Comet 115HP.....	2930	2570	5500
89	11/24	Fairchild T1 TCPL-SM Wasp 400HP.....Landplane	3270	2230	5500
		Seaplane	3894	2098	5992
90	11/24	Loening C-2C 6PCAmB Cyclone 500HP.....	3894	2098	5992
91	11/24	Loening C-2H 6PCAmB Hornet 500HP.....	3894	2098	5992
92	12/1	Pittairn PA-6 1POLB WW 200HP.....	1892	1158	3050
93	12/1	Lockheed Vega 5POLM Wasp 400HP.....	2492	1541	4033
94	12/1	Hamilton H-47 8POLM Hornet 500HP.....	3450	2300	5750
95	12/4	Mohawk Pinto MLV 2POLM Velle 55HP.....	858	474	1332
96	12/31	Atlantic F-XA 14POLM 3 Wasp @ 425HP.....	8134	4966	13100

(See next page for Engines Having Approved Type Certificates)

## STATE AIR LAWS

## Regulatory Laws

WITH the passage of regulatory legislation in 1927 and 1928 by the States of Illinois, Michigan, Mississippi, New Jersey, New York and Virginia, eighteen state laws now provide for periodic examination of pilots and inspection of planes. They are: Arkansas, California, Colorado, Connecticut, Florida, Kansas, Illinois, Maine, Massachusetts, Michigan, Minnesota, Mississippi, New Jersey, New York, Oregon, Pennsylvania, Virginia, Wyoming.

Under the Federal Act, similar requirements prevail in all territories and possessions of the United States and in the District of Columbia and Panama Canal Zone.

The California law, however, provides only for the examination of pilots and the Oregon law only for inspection of planes. In six states (Michigan, New Jersey, New York, Wyoming, Illinois, and Mississippi) Federal examination and inspection is required by the State law.

## Uniform State Law

A uniform State law of aeronautics has been adopted and is still in force in the eleven following states: Delaware, Idaho, Indiana, Maryland, Michigan, Nevada, North Dakota, South Dakota, Tennessee, Utah, Vermont.

The uniform State law contains no regulatory provisions other than the prohibition of acrobatics over thickly settled areas or assemblies and of flying at such low altitudes as to endanger or interfere with existing use. Its provisions do cover sovereignty in space, ownership of space, lawfulness of flight, liability for damage, jurisdiction over air crimes and torts, and contracts, and hunting from aircraft.

In Michigan the uniform State law has been supplemented by regulatory legislation. The regulatory provisions added to the uniform State law as adopted in Hawaii were suspended by the Federal Air Commerce Act of 1926.

## States With No Legislation

In the following 17 States there is no State aeronautical legislation: Alabama, Arizona, Georgia, Iowa, Missouri, Montana, Nebraska, New Hampshire, New Mexico, North Carolina, Ohio, Oklahoma, Rhode Island, South Carolina, Texas, Washington, West Virginia.

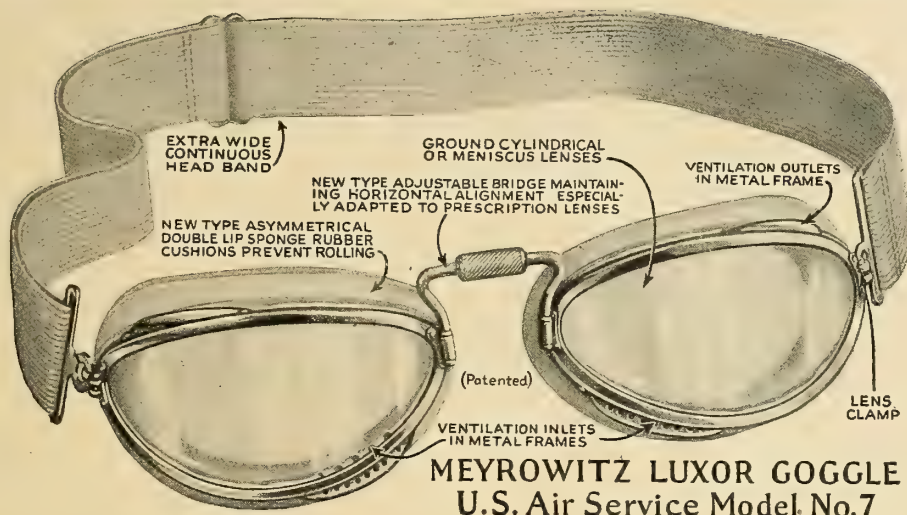
In three other states there is legislation but not regulatory or uniform in character, as follows: Kentucky, Louisiana, Wisconsin.

## Types of State Aeronautic Laws

State aeronautic legislation has been of two types—regulatory laws providing for licensing of airmen and aircraft, air traffic rules, etc., and nonregulatory laws, such as the uniform State law, the purpose of which is to establish the legal status of air navigation in relation to general law.

The District of Columbia law, being regulatory in character, and the regulatory provisions of the Hawaii law were superseded by the Federal Air Commerce act of 1926.

(Continued on next page)



**MEYROWITZ LUXOR GOGGLE**  
U.S. Air Service Model No. 7

**\$13.75 complete with aluminum case**



### PRICES

#### U. S. Air Service No. 7

With white cylindrical bent lenses. (Illustrated)	\$13.75
With tinted cylindrical bent lenses	15.75
With white hand ground meniscus lenses	18.00
With tinted hand ground meniscus lenses	19.50
With white hand ground cylindrical lenses, U. S. Army specification No. 3024	20.00

#### U. S. Air Service No. 6

With white cylindrical bent lenses	\$10.75
With tinted cylindrical bent lenses	12.75
With white hand ground meniscus lenses	15.00
With tinted hand ground meniscus lenses	16.50

#### Regular Model 6

With white cylindrical bent lenses	\$9.75
------------------------------------	--------

#### Luxor Model 5

With white cylindrical bent lenses	\$7.50
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### Tinted Lenses

Meyrowitz Luxor Goggles are made with amber euphos (green) and smoke tinted lenses as desired. Also special lenses conforming to U. S. Army and Navy specifications. Lenses accurately ground to prescription can be fitted in any model.

## Protecting our pilots' eyes

Meyrowitz Luxor Goggle No. 7, U. S. Air Service Model illustrated above, represents the acme of eye protection and comfort. This model is the culmination of years of research, optical experience and practical aviation experiments.

Beyond the fine materials and expert workmanship that are basic with all Meyrowitz Luxor Goggles there are special patented features that have made our goggles the accepted standard for quality and performance. These exclusive features are covered by United States patents:

No. 1,432,406

No. 1,666,407

No. 1,669,229

No. 1,677,747

Unique ventilating system in the metal goggle frame, deflects all air stream away from the eye and prevents the sweating or fogging of the lenses.

Combination lens locking and head-band link device, permits quick replacement of lenses.

New clutch-type bridge with firm grip position hold, provides precise horizontal adjustment for pupillary distance and constant lateral alignment.

Improved double-lip cushion positively prevents any metal touching the face.

Asymmetrical type of sponge rubber cushion makes perfect adjustment to the contour of the face possible, eliminates all air seepage and rolling of the goggles in the wind and provides grateful comfort.

Some of these features have been imitated in other goggles on the market. Although imitation is said to be the sincerest sort of flattery, we urge you to be sure the goggles you buy are *genuine Meyrowitz*—with the name stamped on the frame. Only then, will you secure the quality, the performance and the full value of the exclusive features that have made Meyrowitz Luxor Goggles the most widely used in the world.

Chosen by the world's best aviators, used by the Army, Navy and Marine Corps Air Services, worn by the five intrepid aviators forming the crew of the famous "Question Mark."

Genuine Meyrowitz Luxor Goggles in a wide variety of types sell for \$7.50 up.

*E. B. Meyrowitz*  
INCORPORATED

Est. 1875 and associated companies

**520 Fifth Ave. Dept. A New York**

Send for  
1929 Catalog



Minneapolis

St. Paul

Detroit

Paris

London



## ENGINES HAVING APPROVED TYPE CERTIFICATES

(As of December 31, 1928)

Key: Numerals—number of cylinders; R—radial (arrangement); V—Vee (arrangement); A—air-cooled; W—water-cooled; L—in line.

ATC No.			Rated at H. P. R. P. M.
1	Fairchild Caminez.....	447-C 4RA .....	120 960
2	Warner.....	7RA .....	110 1850
3	Kinner.....	K-5 5RA .....	75 1725
4	Velie.....	5RA .....	45 1750
5	Curtiss Challenger.....	R-600 6RA .....	170 1800
6	Curtiss Conqueror.....	V-1550 12VW .....	600 2400
7	Curtiss Conqueror.....	GV-1570 (geared 2 to 1) 12VW .....	600 2400
8	Curtiss Chieftain H-1640.....	12RA .....	600 2200
9	Aircraft Comet.....	7RA .....	130 1825
10	Curtiss D-12.....	12VW .....	410 2300
11	Dayton Bear.....	4LA .....	76 1425
12	LeBlond 60, 5-cyl. radial.....	.....	65 1950
13	Wright J-5, 9-cyl. radial.....	.....	225 1800
14	Pratt Whitney Wasp, 9-cyl. radial.....	.....	425 1900
15	Pratt Whitney Hornet, 9-cyl. radial.....	.....	525 1900

(State Air Laws continued)

The California and Florida laws have provisions that they become void when Federal legislation takes jurisdiction over and regulates all aircraft. Regulatory provisions of other State laws are superseded by the Federal Air Commerce Act of 1926 in so far as they are inconsistent with it.

### Further Proposed State Uniform Acts

The interest on the part of the various States has become so universal, and the requests for suggestions in the premises so numerous that the department has prepared a bulletin containing three drafts of suggested State legislation covering the subject. Each is designed to accomplish the apparent necessities and at the same time bring about the extremely desirable feature of uniformity.

## AIRPLANE ACCIDENT INVESTIGATION BOARD

FOR the purpose of minimizing aircraft accidents, there has been created in the Department of Commerce an accident investigation board. This board will gather all available data on airplane accidents; it will analyze carefully the evidence collected; and when the causes of the accidents have been definitely determined, these reasons will be classified.

Members of the new board are E. P. Howard, of the regulations divisions, president; Gilbert G. Budwig, chief of the inspection division; Dr. Louis H. Bauer, medical director; C. L. Ofenstein, chief of the engineering section, and E. McD. Kintz, legal counsel.

## CHANGES IN ENGINE TEST REQUIREMENTS

THE following changes were made on November 22, 1928, in the department's requirements for the approval of engines to be used in licensed aircraft:

(1) The first period of the endurance test will be run at the rated speed specified by the manufacturer and the power rating of the engine will be based on the average power developed at full throttle during this period.

(2) The remaining nine test periods will

be run at approximately 97 per cent of rated speed and the power in these runs must be at least nine tenths of the rated power.

(3) The maximum permissible engine speed at full throttle in level flight is to be 103 per cent of the rated speed.

## AIRCRAFT ACCIDENTS

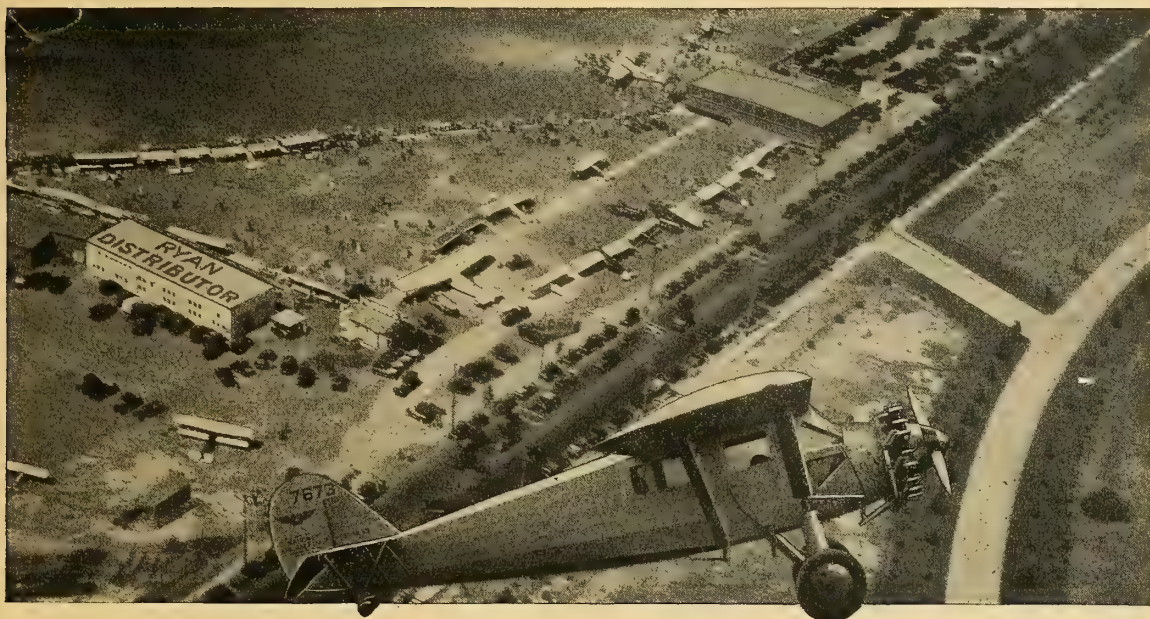
SYNOPSIS OF N. A. C. A. REPORT No. 308

THIS report on a method of analysis of aircraft accidents has been prepared by a special committee on the nomenclature, subdivision, and classification of aircraft accidents organized by the National Advisory Committee for Aeronautics in response to a request dated February 18, 1928, from the air coordination committee consisting of the Assistant Secretaries for Aeronautics in the Departments of War, Navy, and Commerce. The work was undertaken in recognition of the difficulty of drawing correct conclusions from efforts to analyze and compare reports of aircraft accidents prepared by different organizations using different classifications and definitions. The air coordination committee's request was made "in order that practices used may henceforth conform to a standard and be universally comparable." The purpose of the special committee therefore was to prepare a basis for the classification and comparison of aircraft accidents.

Report No. 308 may be obtained upon request from the N. A. C. A.

N.A.C.A. AIRCRAFT ACCIDENT ANALYSIS FORM																																																																			
CLASSIFICATION OF ACCIDENT				UNDERLYING CAUSES OF ACCIDENT:																																																															
NATURE: <u>CLASS C TAIL</u>				ERRORS OF PILOT				MATERIEL FAILURES																																																											
SPIN FOLLOWING ENGINE FAILURE				LACK OF EXPERIENCE				PHYSICAL AND LOGICAL				FAULTY INSTRUCTIONS				INSPECTION				MATERIALS				DESIGN																																											
RESULTS:				GENERAL				SPECIAL				DISEASE				DEFECT				POOR REACTION				OPERATING				MAINTENANCE				OVERHAUL				INDETERMINATE				DETERIORATED				INDETERMINATE				STRENGTH (STRUCTURAL)				ARRANGEMENT				AERODYNAMIC				INDETERMINATE				MODIFICATION			
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PREPARED AND RECOMMENDED BY  
SPECIAL COMMITTEE ON THE NOMENCLATURE, SUBDIVISION  
AND CLASSIFICATION OF AIRCRAFT ACCIDENTS  
NATIONAL ADVISORY COMMITTEE  
FOR AERONAUTICS  
JULY 17, 1928



# Why air activities are centered at Ryan Distributor's hangar

Here are the plain facts—what it means to be a Mahoney-Ryan Distributor:

You become part of a nation-wide organization which has taken first place in its chosen field. Each member of this organization is devoted to an ideal which first took shape in the "Spirit of St. Louis."

The Sister Ship, the present Mahoney-Ryan Brougham, is designed and built to insure your success. It anticipates the wants of your market.

It is built in a modern factory equipped with every known facility for building right.

The performance of the Mahoney-Ryan Brougham speaks

for itself. *It takes off faster and lands slower, with its full load, than any other plane of its type. It is the only plane of its type with a service ceiling of over 16,000 feet.*

Designed primarily for commercial air travel and for use of important business executives, it has the sturdiness and ability to serve as special express carrier in many lines of trade.

Because of these facts, the Mahoney-Ryan Aircraft Corporation builds and sells, through its distributors, more Whirlwind cabin monoplanes than any other maker.

In territory not yet taken up, we offer an attractive proposition to individuals or groups qualified to handle the line. We invite correspondence.

## Present representation includes these leading distributors:

AIRCRAFT AND AIRWAYS OF AMERICA...	MILWAUKEE, WIS.	RANKIN FLYING SERVICE.....	PORTLAND, ORE.
.....Pittsburgh, Pa.	AURORA, ILL.	MUTUAL AIRCRAFT CORP'N	LOS ANGELES, CALIF.
MASSACHUSETTS AIRWAYS CORPORATION...	KANSAS CITY, MO.	LYOYD-MOSIER AIR COMMERCE, INC.	.....
.....Springfield, Mass.	OMAHA, NEBR.	.....	COLORADO SPRINGS, COLO.
CAPITOL AIRWAYS, INC. ....	FORT WORTH, TEXAS		
Washington, D. C.	MINNEAPOLIS, MINN.		
BUFFALO AIRCRAFT DISTRIBUTORS.....	RAPID CITY, SO. DAKOTA		
.....Buffalo, N. Y.	SCENIC AIRWAYS, INC.		
CAPITOL AIRWAYS, INC. ....	.....		
Indianapolis, Ind.	GRAND CANYON, PHOENIX, ARIZ.	M. A. ZUNIGA.....	CENTRAL AMERICA
MENEFEE AIRWAYS, INC. ....	MISSION AIRPLANE SERV.	AIRGOLD, LIMITED.....	SYDNEY, AUSTRALIA
New Orleans, La.	SAN ANTONIO, TEXAS	MITSUI & CO.....	JAPAN
LOUISVILLE POINT LUMBER CO.....	SALT LAKE CITY, UTAH	COUNT G. BONMARTINI.....	ROME, ITALY
.....Louisville, Ky.		L. E. GALE COMPANY.....	HANKOW, CHINA
KNAPP FLYING SERVICE.....			
Ypsilanti, Mich.			

## The MAHONEY - RYAN AIRCRAFT CORP'N

Lambert-St. Louis  
Airport



Anglum, St. Louis County  
Missouri



## Washington Observations

By Wing Over

WITH the inauguration of Herbert Hoover on March 4, the nation should look forward to four years of expansion for aeronautics and a consequent prosperity among aircraft producers and operators. Naturally there is some speculation in the capital city as to who will comprise the new air cabinet. The three present members will submit their resignations as a matter of form, and since each of them has done a good job and each can find a good place for himself outside of the Government, it is not known whether they will be receptive to reappointment. It has been rumored that at least one will head up an important group in the industry. This one is the popular Wm. P. MacCracken, a wartime instructor in the Air Service, who went from chairman of the American Bar Association's aviation committee to be the initial Assistant Secretary of Commerce for Aeronautics. His task was a difficult one—one of formulating the Air Commerce regulations and inaugurating the machinery necessary for their enforcement. The man who assisted in this work, another lawyer, came from Des Moines and saw action with the Air Service in Italy. He also had experience in commercial airline operation. Major Clarence Young, therefore, needs no grooming as a successor to Mr. MacCracken, for he has been Director of the Aeronautics Branch since that position was created.

There has been, of course, as there would be of any regulatory body, some criticism of the manner in which the Department of Commerce has enforced its newly attained powers. On the whole, however, it is agreed that its work, so fraught with chances for error, has been accomplished with foresight and expediency and that the industry is in a better condition than it would be if there had been no Air Commerce Act and if there had not been such men as Messrs. MacCracken and Young in charge.

One of the most important channels of accomplishment to be followed through to a successful conclusion by the next Assistant Secretary of Commerce for Aeronautics, is that in connection with the licensing of American aircraft in foreign countries. Major Young has already had experience in the reciprocal negotiations now pending and has done effective work along these lines.

It has been the duty of Major Young to build up an organization consisting of personnel acceptable to the industry which it serves, and credit is due him by virtue of the fact that everyone in the Branch with the exception of the engineers and clerks, is a flier. Major Young, himself, flies solo all over the country as do the division chiefs when the occasion demands.

EVEN in that part of the Department of Commerce which has to do with the promotion of trade, which part is not under the Aeronautics Branch, the aeronautic trade specialist is a transport pilot who engaged in military and later commercial aeronautics, from barnstorming to the actual selling of airplanes. This branch of the Department, the Aeronautics Section of the Bureau of Foreign and Domestic Commerce, coöperates very closely with the Aeronautics Branch. Leighton W. Rogers, who was executive officer for the recent International Aeronautics Conference, states that the work of this section, of which he is chief, has increased three-fold since July 1, 1928. There are numerous projects for foreign air mail and air transport which call for the attention of the Section. Trade opportunities are constantly coming to hand which have meant and will mean foreign business for the American aeronautics industry. Rogers reports a shipment of five airplanes en route to China and one each to New Zealand and Argentina.

JAMES D. SUMMERS, American Trade Commissioner for Aeronautics in Latin America, who came to Washington for the international conference from Panama, where he has made his headquarters, leaves early this month for a tour of Central and South America in the interest of aeronautic sales. He was formerly a member of the First Pursuit Group, later an Aeronautics Branch airways engineer, and since January 1, 1927, has been Trade Commissioner under the Bureau of Foreign and Domestic Commerce. During the spring of 1927, he made a complete tour of South America and has reported some valuable data to the Bureau which has been made available to airplane manufacturers. Summers has also been instrumental in assisting Pan American Airways, Inc., in obtaining permission to land in certain of the Central American countries. Inasmuch as there has been some talk of the National Air Tour covering South America in either 1929 or 1930, Summers was asked regarding the feasibility of such a trip. His statement in reply follows:

"Such a tour with twenty to fifty commercial airplanes would result in a great amount of good not only from the standpoint of sales, but from that of South American countries where there is a need for more adequate transportation. The tour would educate South Americans as to the reliability and efficiency of American aircraft. Furthermore, it is only by actual demonstration that we can hope to sell more than an occasional airplane in that territory. The air tour in South America, however, would have to traverse a much more difficult territory than it has covered previously in the United States, because of the few good airports and absence of servicing facilities. Careful study of the territory to be covered will be necessary before the decision is made to have at least a part of the itinerary of the tour cover South America. The flight from Lima, Peru, to Rio de Janeiro, Brazil, by way of Santiago, Chile, and

Buenos Aires has been made many times, and twice by Jimmy Doolittle without difficulty. These flights were made without elaborate ground organization, but the management of the tour would have to make the usual pathfinding survey and even go so far as to promote the enlargement and improvement of certain of the landing fields. The trip would consist of about 3,500 miles and, for the next several years, it would be advisable to ship the planes down to either Lima or Rio de Janeiro for the start of the tour and conclude it at one of the two points. The territory intervening, that is Central America or the West Indies, does not at this time present very considerable possibilities for aeronautic activities other than those now in operation or programmed for the near future.

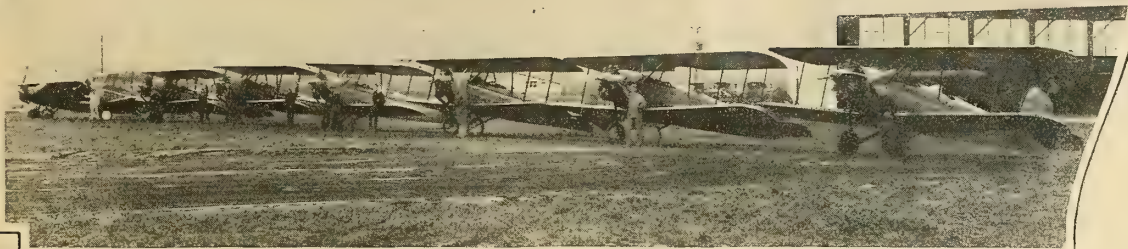
It is expected that by the time this appears in print, a Bellanca CH monoplane powered by a Wright J-5 will be well on its way through Central America and perhaps over the Southern continent on its way to Buenos Aires. Alfred D. Chandler, treasurer and sales manager of the Bellanca Aircraft Corporation, spent several days in Washington last month collecting information for the Latin-American flight which is the first to be made by a strictly commercial airplane on a demonstration mission. Dean I. Lamb, formerly of the Royal Air Force and Paraguayan Air Service, is pilot with a Mr. Zigliano, a Uruguayan, as mechanic and reserve pilot. Since his proposed itinerary includes Colombia, Ecuador, Peru, Bolivia, Chile, Argentina, Uruguay and Brazil, as well as Mexico, Panama and Central American stops, he should be in a position to make valuable reports to the Detroit Board of Commerce as to the airports and reception the National Air Tour might expect to find.

A FORMIDABLE colony of unofficial aeronautic experts has grown up in Washington since the recently attained prosperity in the aeronautics industry. The latest acquisition is J. P. Murray, formerly pilot on the Cheyenne-Omaha and Cheyenne-Salt Lake City run of Boeing Air Transport, Inc. Mr. Murray has taken residence in Washington to assist Geo. P. Tidmarsh, vice president of the Boeing company. Murray has over 6,000 hours time in the air, considerable of which has been on the night mail. His new assignment will consist of liaison work between the Boeing (and allied interests) and the various Government departments.

RESERVE CAPTAIN MARSHALL BOGGS, who has been assisting Edward P. Howard, Chief of the Air Regulations Division, Aeronautics Branch, couldn't stand desk work. He requested his transfer and is now engaged in establishing the factory inspection system in different parts of the country. Tall, slim and personable Ed. Howard, before and since his promotion from "acting" to chief of Air Regulations, has been one of the busiest persons hereabouts. He burns the midnight oil in his

(Continued on next page)

# Is Anything Less Than ***THE BEST*** In Training Good Enough for *you?*



## SPARTAN School of Aeronautics Offers the ***BEST*** Training Possible to Develop

**S**ELECTING a school of aviation should not be difficult, for today the insistent demand is for **BETTER** pilots who have had the **BEST** training.

Now, the makeshift pilot is unpopular. The public is educated to the point where the aviation enthusiast can pick out the good pilot, just as the baseball fan judges his ball players. Airplane pilots **MUST** be good!

No longer does the choice of a training course depend on flash in advertising, imposing displays of airplanes, indefinite promises or "new methods." The student pilot of today wants to **KNOW** that he is getting quality.

The Spartan School of Aeronautics is organized and operates by that standard.

No other school uses as many expensive biplanes exclusively for training.

Every training ship is powered with a nine-cylinder, radial, air-cooled motor.

Ships and motors are inspected regularly by the Department of Commerce.

The instruction staff is composed of men of character, high ability and wide experience—all transport pilots.

The modern 400-acre Tulsa municipal airport serves as flying field for Spartan students.

The million dollar Spartan Aircraft Company factory is their technical classroom.

Climatic conditions at Tulsa offer flying weather with virtually no interruptions.

The Spartan tuition charge is recognized as standard—and the charge for solo flying is 40 per cent less than the charge for dual control instruction.

There is only one "method" for teaching men to fly. That method is flight. The rest depends upon the ability and personality of instructors, use of modern equipment powered with modern motors and the advantage of a great airport and its attractions to national air travel.

Watch for announcement of our booklet,  
**TRAINING THAT PRODUCES NATURAL PILOTS,**  
and write for your copy.



Capt. C. F.  
Gilchrist  
Director



Lieut. J. G.  
Hainlip  
Chief Instructor



A. K. Nims  
Asst. Chief  
Instructor



Ewd. H. White  
Ground School Chief

# SPARTAN SCHOOL OF AERONAUTICS



Tulsa, Oklahoma



(Washington Observations continued)

office and from all indications has been doing some fine work in systematizing and expediting the regulation of aircraft in commerce. This blond Californian seems to be Major Clarence Young's right hand man and is mentioned as the logical candidate for Director if the Major receives the Assistant Secretaryship. Howard finds some time to fly and recently won a cup for taking the largest ship, a Buhl Special Air-Sedan, to the inauguration of the airport at Helbron, Md.

NAVY fliers on test work at Anacostia have a new toy, of rather mammoth proportions, in the form of the new twin-engine Consolidated flying boat. With its high mono-wing strutted above the thin-rounded hull and two geared Wasps, it has the appearance of a flying pontoon. The 120 m.p.h. top speed, which it is reported to have attained, is unusual for a boat with a hundred-foot span and only two engines. Ex-naval-Lieutenant Gorton, now with the Consolidated Aircraft Corp., flew the ship in from the factory at Buffalo.

IT is reported that "Cap" Joe Boudwin, of the Washington Airport and U. S. Air Transport, Inc., has resigned to accept a tour of duty with the Army Air Corps. Another resignation, this one confirmed, is that of Lawrence Pabst, formerly Marine lieutenant, who is now flying mail from Miami to Jacksonville for Pitcairn.

THE site for the District of Columbia airport has not yet been chosen. War, Navy and Commerce Department officials are working on this problem with energy but without success to date. Senator Hiram Bingham, president of the National Aeronautic Association, by virtue of being on the District's committee in the Senate, is active in obtaining an airport for the city which will compare with those at Croydon, Le Bourget and Tempelhof. That Hoover Field and Washington Airport, as well as the Bolling and Anacostia joint fields of the Army and Navy, respectively, are far from being adequate for the nation's capital, was the gist of Senator Bingham's admonishment in a recent speech.

J. DON ALEXANDER, president of the J. Alexander Aircraft Company of Colorado Springs, Colo., has been chosen as the seventh of the group of men in the aeronautical industry who will comprise the advisory board for the Aviation Institute of the United States. The other members of the board are Frank E. Tichenor, Casey Jones, Dick Depew, Frank Gardner, Ross King and John Perkins.

TWO famous aviators from the Argentine arrived at Hoover Field last month in a Bellanca flown by Wesley Smith of Philadelphia. Lieutenant Claudio Mejia and Mr. Diego Arzena are planning a flight from Buenos Aires to Seville, Spain, in honor of the recently inaugurated President of Argentina.

## FLORIDA AIR NEWS

By JOHNSON WRIGHT

PITCAIRN AVIATION, INC., operator of the air mail between New York and Miami, has announced that a feeder line will be operated from Jacksonville to Tampa beginning February 15th. By the proposed schedule, mail posted in Tampa before noon will be delivered in New York the following morning, and all air mail from New York will be delivered in Tampa at noon the following day.

MELBOURNE formally opened her airport immediately preceding the Miami air meet. The field, a splendid one, is located just west of the little city. It is on high well drained land in open country allowing unlimited space for landing and taking off. The location of the field is exactly half way between Jacksonville and Miami, and many pilots use it to break what otherwise is rather a long hop. Fueling facilities are available at all times.

CONSTRUCTION of the large steel hangar at the Miami municipal airport was completed January 1st, and hangar facilities are now available at this airport. The Curtiss Flying Service and Pitcairn Aviation are regular users of the hangar.

CLASSES in aviation at the University of Miami opened January 2nd. E. B. Lemmon, a former Army pursuit pilot, is instructor. Among the subjects taught are theory of flight, aerial navigation, engine and plane maintenance, mapping, photography, telegraphy, and meteorology. Arrangements have been made by the university to have the students given flight instruction by the Curtiss Flying Service.

A CHAPTER of the National Aeronautic Association was organized in Miami on December 20th. Francis M. Miller was elected president; R. V. Waters and O. A. Sandquist, vice presidents; and A. H. Hermance, secretary.

THE D. W. Flying Service of Leroy, N. Y., has flown three ships to Miami, where it is now operating them. Two of them, a C6 Seagull and a Loening cabin amphibian, are being operated from the Rogers Air Lines' base, and a Challenger on wheels is being flown from the 54th Street Airport.

A FAST flight was made between New York and Miami on December 23rd, when a Sikorsky S-38 of the Curtiss Flying Service was flown to Miami by Pilot Ray Applegate in 9 hours and 55 minutes air time.

AS a result of the intensive work done by the Fort Myers Aero Club, the airport at that city, which was once used by the Florida Airways when they were operating between Miami, Tampa, and Jacksonville in 1926, is being put in shape. A large marker is being placed in the center of the field. Efforts are being made to have a modern hangar constructed on the field.

THE Hollywood airport was dedicated and officially opened on January 1st. J. M. Yonge, chairman of the Miami municipal air board, was a guest and the principal speaker. John T. Rogerson, chief pilot for the Massachusetts Airways, Inc., is field manager. The airport is suitable for the average commercial ships. The Airways has available a Ryan Brougham and two Eagle-locks for general service work.

THE air meet which was scheduled to dedicate formally the Jacksonville municipal airport on December 1st was postponed until the 8th because of unfavorable weather. The principal events held were a nine-mile race for OX-5 planes, which was won by Laurie Yonge, piloting a Curtiss Robin. Wesley Raymond in an Eaglerock was second, and Bill Alexander in his Travel Air was third.

TWO trimotored Fords operated by the Skyview Lines are at present flying at West Palm Beach and Miami. These ships are on a good-will tour of the country, which is sponsored by the Niagara Falls Chamber of Commerce. According to the schedule prepared, the ships will fly in all sections of the country. They will remain in Florida until March 15th. Phillip N. Fleck is the chamber of commerce representative on the tour. The operating manager is Henry S. Jones, and the pilots are Harold E. Gray and Capt. Richard Bibby.

### Pan American Airways Inaugurates New Routes

WITH its planes flying approximately 3,300 miles on January 9th, Pan American Airways completed on schedule an extensive program which included the inauguration of air mail, passenger, and express service between the United States and the Bahamas and West Indies Islands, the dedication of its new airport at Miami, and the opening of one of the finest air passenger stations in the world.

The dedication ceremony and the departure of the four planes on the inaugural flights were impressive. The program began at 7:30 a.m. with the raising of the flags of the United States, Cuba, Great Britain, Haiti, San Domingo, and Porto Rico—to which countries the planes later departed. Brief speeches by Postmaster General New, Col. John A. Hambleton, W. Irving Glover, Assistant Postmaster General, Mayor E. G. Sewell, and Miss Amelia Earhart were interspersed in the program.

Promptly at 8 a.m., the Havana Air Limited took the air and roared away. At 8:15, the Havana Air Express followed. The Nassau Air Limited, which was the next away, left at 9:10 a.m. This departure was followed five minutes later by the West Indies Air Limited, which was scheduled to make its first stop at Havana.

With exception of the West Indies Air Limited, these planes make round trips, the Nassau Air Limited tri-weekly and the Havana planes daily. Receptions were held at 1:30, 4:35 and 5 p.m. for the Havana Air Limited, the Nassau Air Limited and

(Continued on next page)

# LAIRD-Whirlwind LC-R Wins New Honors



Two Firsts in the Miami air-races—and a dawn-to-dusk flight from Miami to Chicago in 9 hrs. 59 minutes actual flying time, 11 hours elapsed time—new records set up by Laird-Whirlwind L C-R.



**S**TILL more honors for this Laird plane and pilot Ballough. Fifteen minutes after finishing the 1260 mile, Chicago-Miami trip, Ballough entered his Laird L C-R in the 800 cu. in. race—and won. Next day he again entered his ship in the race—and again won first place. Two days later, with Charles Dickinson as passenger, he made the record breaking return trip to Chicago in 9 hrs. 59 minutes flying time, 11 hrs. 5 minutes elapsed time. This same ship and pilot made the record non-stop flight from Chicago to New York in 4 hrs. 40 minutes.

*Laird ships are consistent winners*

1st—800 cubic in. closed course races, Los Angeles....1928  
2nd—New York-Los Angeles Derby .....1928  
1st and 2nd—Los Angeles-Cincinnati Derby .....1928  
1st and 2nd—New York-Spokane Derby .....1927

Speed and dependability! Similar records made by Laird ships in government, commercial and private use justify our claim:

*Laird superior design and Laird superior workmanship plus Wright-Whirlwind power result in the perfected flying unit.*

Laird airplanes are built for the commercial buyer whose chief interest is high efficiency and dependability rather than price. We invite such buyers to write for our free booklet and name of local distributor who can arrange a demonstration.

**Distributors:** Exclusive territories available for established firms with funds and suitable demonstration facilities to handle Laird sales. Enlarged factory space and increased production facilities insure prompt delivery.

**E. M. LAIRD AIRPLANE COMPANY**

Ashburn Field—4500 W. 83rd St., Chicago

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Municipal Airport Dedication  
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**MIAMI**  
January 7th and 8th  
Two races open cockpit, 200 H.P. class  
or less. FIVE CASH PRIZES each  
race. total, \$1600  
*Laird Wins Both Races!*





(Florida Air News continued)

the Havana Air Express, respectively.

Simultaneously with the departure of the West Indies Air Limited from Miami, a similar plane, with Miami as its destination, departed from San Juan, Porto Rico, where appropriate ceremonies were held. Enthusiastic receptions were tendered the crews and passengers at all cities at which the planes made stops.

Among those who were guests of the Pan American Airways on the inaugural flights of the airliners were Postmaster General New, Miss Earhart, Assistant Secretary William P. MacCracken, Jr., Mrs. James Gilman, Mr. Glover, Mr. and Mrs. James Warner Bellah, Lady Mary Heath, E. R. White, superintendent of foreign mails, newspaper men, and others.

The new passenger station is one of the finest of its kind in the world today. It is of Spanish architectural design. A large waiting room in the center is divided by an iron railing to separate outgoing and incoming passengers. On the first floor, around the waiting room, are ticket and administrative offices and offices for customs, immigration, and public health department officers, for the airport has been officially designated a port of entry from foreign countries. On the second floor is a balcony running around the waiting room, around which are located offices of the operating department, lunch rooms, a pilots' room. On the south there is a large porch from which the activities on the field may be observed.

The airport is complete in every respect and one of the finest in the United States. The runways are 2,800 feet long and are paved with rock. Complete lighting equipment has been installed and is in operation. The company's plans call for the construction of two additional hangars. A contract has already been let for the first.

On the Miami-Nassau route, which is principally over water, Sikorsky amphibians powered by two Wasp engines are used. On the Miami, Havana and West Indies route, luxurious Fokker trimotored transports of the F-10A type are used. These are powered by Wasp engines and are manned by a crew of four, which includes two pilots, one of which is also the radio operator, a radio mechanic, and a steward.

Beginning February 4th, the airways will institute a bi-monthly service between Miami and Panama. This will be a preliminary

service to the regular tri-weekly service to be inaugurated within the next few months. According to plans at the time of this writing, Col. Charles A. Lindbergh, who has recently been retained by the Pan American in an advisory capacity, will pilot the first plane over the route, which is scheduled to leave Miami on February 4th. This extension, together with the extensions into the Bahamas and West Indies Islands now operating, is only one of a series which will eventually connect the United States with all of the principal cities in Central and South America.

THE Army and Navy Club of Tampa has completed its first year and a half, as an organization in which officers and former officers of the services can meet socially and maintain their keen interest in the problem of national defense. Founded in June, 1927, by Major Phillip G. Murphy, the club acquired quarters at the Tampa Terrace Hotel but was not formally organized until October, 1927.

The active membership of the club is confined to fifty, with a waiting list thereafter. The officers of the club are: Major Phillip G. Murphy, president; Capt. George B. Howell, first vice president; Major Cody Fowler, second vice president; Lieut. Col. H. C. Culbreath, third vice president; Major James C. Williams, secretary; Lieut. Col. James W. Morris, Jr., treasurer; and Capt. Hood C. Hampton, asst. treasurer.

BECAUSE existing facilities are already heavily taxed to accommodate the international air mail and passenger service operated by Pan American Airways, that company has requested all operators of aircraft to coöperate in keeping clear at all times the new Pan American Airport at Miami. With five airliners operating daily from the airport, hangar space is entirely filled and all servicing facilities are completely utilized.

The field is, of course, available in case of an emergency and for planes entering from foreign ports. The latter, however, must notify Pan American Airways in advance so that the proper officials can be present.

PALM BEACH AIRPORT, located one mile south and three miles west of West Palm Beach, is now in a position to receive visiting ships. Standard aviation products

and telephone facilities are available at the field, and property is guarded at night by a watchman. The three-ship hangar which was destroyed by the recent hurricane has not yet been replaced.

Palm Beach Flying Service, Inc., will soon resume its school work there as conducted last year. During January, February and March, Sky View Lines, Inc., of Detroit, is operating a Ford trimotor from the field.

Henry Hublitz is manager of Palm Beach Airport.

#### Miami Air Meet Results

WITH a gathering of more than 100 airplanes, representing all sections of the United States and Cuba, and a large number of notables, the All-American Air Meet was held in Miami, January 6th to 9th. It has been declared the greatest air meet ever held in the South.

The meet, originally scheduled for three days, became a four-day affair when a 15-mile race for seaplanes for the Gar Wood trophy was added for the 6th. As in all big meets, the Army, Navy, and Marine corps officers took prominent parts and the exhibitions given by these fliers were most popular with the spectators. During the afternoon of the 8th, Lt. Al Williams in a Wasp-powered Curtiss Hawk gave a 15-minute exhibition of corkscrew turns, outside loops, and inverted flight such as he only can give at low altitude. Exhibitions of ground attack were furnished by the Third Attack Group from Fort Crockett, Galveston, Texas, which was led by Major J. H. Jouett.

Among the outstanding events of the meet were the non-stop flights of William S. Brock and Lee Schoenhair from Detroit to Miami in the remarkably fast time of 9 hours and 25 minutes. Each piloted a Wasp powered Lockheed monoplane and carried passengers.

The American flag was raised and the Miami Municipal Airport dedicated during the morning of the 7th. Postmaster General New, Assistant Secretary MacCracken, and Mayor Sewell made brief speeches during the ceremony. Early last year, the land on which the airport is located was donated to the city of Miami for airport purposes by Glenn H. Curtiss. Since that time, a modern airport has been constructed. Future

(Continued on next page)



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(Florida Air News continued)

plans call for one of the finest airports in the South.

On many occasions during the meet, Lady Mary Heath demonstrated her skill in handling her little DH Moth.

James Ray, C. J. Faulkner, and Freddie Cann gave night flying exhibitions in Pitcairn Mailwings.

Aside from the added attraction provided by the special exhibition by Lt. Williams, the stunting honors went to Master Sergeant B. F. Belcher of the Marine Corps, Lt. D. Rittenhouse of the Navy, and Capt. R. O. Rogers of the Marines.

The Gar Wood trophy for seaplanes was won by Eddie Stafford, who piloted a C-6 Seagull. Harry Wickes in a Hornet-powered Loening amphibian was second, and Clarence Silver in another C-6 Seagull was third.

William Lofton Dennis, Miami high school student, who won the AERO DIGEST prize for the best scale model at the model contest conducted by the American Model League of America last summer, won first prize in the air mail cachet design contest, sponsored by the Greater Miami Airport Association. All letters during the All-American Air Meet were stamped with the cachet designed by Dennis.

## KENTUCKY AIR NEWS

By JOHN WALKER ROGERS

THE National Aviation School, Louisville, held its first classes on January 14. The instructors are: E. J. Pinaire, general manager, who will instruct classes in aviation theory and science; Joseph Murphy, in motor mechanics; R. W. Bottoms, in aeronautics; Charles Kirke, registrar.

The National Aviation School expects to enter the airplane manufacturing field within a short time.

THE travel department of the Liberty Bank and Trust Company, Louisville, will act as general passenger agent for Interstate Airlines, Inc. Tickets will be on sale and information will be available.

P. M. KINVANON will assume the duties of Robert Gast, former general manager for the Cardinal Fliers, Inc., Bowman Field, Louisville. Mr. Gast is now the private pilot for John Hertz, Chicago millionaire sportsman and racehorse owner, who will fly to a Florida resort to spend the winter.

PRICES for the use of parking space in Bowman Field, the municipal airport in Seneca Park, have been fixed by the Louisville and Jefferson County Air Board. For transient planes, the overnight storage rate is one dollar; private planes, monthly rate, five dollars; commercial planes, monthly rates, seven to ten dollars.

J. E. COOK is now district manager for the Aviation Transport and Service Corporation in Louisville, succeeding Jack Rollins. The Chicago company maintains an office here for the purpose of enrolling students in its aviation school conducted in Chicago.

## RESULTS OF THE ALL-AMERICAN AIR MEET HELD AT MIAMI, FLORIDA JANUARY 6-9, 1929.

### January 7th

1. 15-mile race for planes powered with motors of 90 horsepower or less.				
Douglas N. Davis	Travel Air	OX-5	8:05	\$250 and cup
Dale A. Jackson	Robin	OX-5	8:22	150
A. B. McMullen	Travel Air	OX-5	8:26	100
H. S. Myhres	Simplex	Kinner	8:40	50
Lady Mary Heath	DH Moth	Cirrus	8:57	25
2. 15-mile race for open cockpit planes of Whirlwind class.				
E. E. Ballough	LaIRD	J5-B	6:35	\$250 and cup
James G. Ray	Pitcairn P5	J5-C	7:53	200
C. J. Faulkner	Pitcairn P5	J5-C	7:54	100
Arthur J. Davis	Waco-10	J5-C	8:17	75
H. S. Myhres	Simplex	Kinner	8:27	50
3. Stunting exhibition by service planes.				
Sgt. B. F. Belcher	Hawk	D-12		Trophy
Capt. R. O. Rogers	Hawk	Wasp		Trophy
Lt. D. Rittenhouse	Hawk	Wasp		Trophy
4. 15-mile race for observation type planes.				
Lt. R. C. Winston	Douglas	Liberty	7:53	Trophy
Lt. N. L. Cole	Douglas	Liberty	8:05	Trophy
Lt. J. W. Person	Douglas	Liberty	8:13	Trophy
5. 15-mile race for cabin planes of Whirlwind class.				
S. T. Stanton	Cessna	J5-C	7:06	\$250 and cup
Frank C. Hawkes	Lockheed Vega	J5-C	7:12	200
Jack Atkinson	Monocoupe	Warner	8:01	100
John T. Rogerson	Ryan	J5-C	8:04	75
J. Wesley Smith	Bellanca CH	J5-C	8:14	50
6. Bomb-dropping to a mark.				
Douglas N. Davis	Travel Air	OX-5	46 ft.	\$100 and cup
Arthur J. Davis	Waco-10	OX-5	61 ft.	75
Lowell R. Bayles	Eaglerock	OX-5	78 ft.	50
7. Dead-stick landing to a mark.				
Arthur J. Davis	Waco-10	J5-C		\$100 and cup
Lady Mary Heath	DH Moth	Cirrus	10 ft. 2 in.	75
A. B. McMullen	Travel Air	OX-5	12 ft. 9 in.	50
Lowell R. Bayles	Eaglerock	OX-5	62 ft.	25
			65 ft.	15
8. 15-mile race for Army pursuit planes.				
Lt. G. H. McNair	Falcon	D-12	7:01	Trophy
Lt. O. C. George	Falcon	D-12	7:09	Trophy
Lt. George C. McGinley	Falcon	D-12	7:10	Trophy
Lt. R. H. Lee	Falcon	D-12	7:15	Trophy
Lt. J. T. Flock	Falcon	D-12	7:17	Trophy
9. Parachute drops to a mark.				
Barnie G. Rowe			35 ft.	\$75 and cup
Clarence McArthur			144 ft.	50
Dick Hunter			245 ft.	25

### January 8th

1. 15-mile race for planes with motors of 90 horsepower or less.				
Otto Enderton	Challenger	OX-5	8:44	\$250 and cup
Dale A. Jackson	Robin	OX-5	9:11	125 (tie)
Verne Roberts	Monocoupe	Warner	9:11	125 (tie)
Douglas N. Davis	Travel Air	OX-5	9:19	50
A. B. McMullen	Travel Air	OX-5	9:21	25
2. 15-mile race for open cockpit planes of Whirlwind class.				
E. E. Ballough	LaIRD	J5-C	6:57	\$250 and cup
C. J. Faulkner	Pitcairn P5	J5-C	7:32	200
James C. Ray	Pitcairn P5	J5-C	7:36	100
Arthur J. Davis	Waco-10	J5-C	7:46	75
H. S. Myhres	Simplex	Kinner	8:32	50
3. Stunting exhibition by service planes.				
Lt. D. Rittenhouse	Hawk	Wasp		Trophy
Sgt. B. F. Belcher	Hawk	D-12		Trophy
Lt. C. H. Lewis	Hawk	Wasp		Trophy
4. 15-mile race for observation type planes.				
Lt. J. W. Person	Douglas	Liberty	7:55	Trophy
Lt. R. C. Winston	Douglas	Liberty	7:59	Trophy
Lt. N. L. Cole	Douglas	Liberty	8:10	Trophy
5. 15-mile race for cabin planes of Whirlwind class.				
S. T. Stanton	Cessna	J5-C	7:01	\$250 and cup
Frank M. Hawkes	Lockheed	J5-C	7:09	200
J. Wesley Smith	Bellanca	J5-C	7:48	100
Jack Atkinson	Monocoupe	Warner	8:09	75
O. K. Bevins	Lockheed	J5-C	8:11	50
6. Bomb dropping to a mark.				
Lowell R. Bayles	Eaglerock	OX-5	39 ft.	\$100 and cup
Arthur J. Davis	Waco-10	J5-C	78 ft.	75
James C. Ray	Pitcairn	J5-C	96 ft.	50
7. Dead-stick landing to a mark.				
Dale A. Jackson	Robin	OX-5	4 ft. 3 in.	\$100 and cup
Otto Enderton	Challenger	OX-5	5 ft.	75
Dr. J. E. Owen	Eaglerock	OX-5	7 ft. 7 in.	50
Dick Bennett	Waco-10	OX-5	15 ft. 7 in.	25
F. M. Snyder	Waco-10	OX-5	46 ft.	15
8. 15-mile race for all types of service planes.				
Lt. Pugh	Navy Hawk	D-12	5:38	Trophy
Lt. Brice	Navy Hawk	D-12	5:46	Trophy
Lt. Hughes	Navy Hawk	D-12	5:47	Trophy
Sgt. Belcher	Marine Hawk	D-12	5:50	Trophy
Lt. McNair	Army Falcon	D-12	7:01	Trophy
Lt. George	Army Falcon	D-12	7:45	Trophy
Lt. McGinley	Army Falcon	D-12	7:47	Trophy
Lt. Lee	Army Falcon	D-12	8:01	Trophy
Lt. Flock	Army Falcon	D-12	8:08	Trophy



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## LOUISIANA AIR NEWS

By HAROLD A. DEMPSEY

CHAIRMAN A. L. SHUSHAN, of the airport committee of the Orleans Levee Board, drove the first stake to mark the formal commencement of construction on the new municipal airport for New Orleans. It will be located on the shore of Lake Pontchartrain, near the mouth of the Industrial canal. The distance is only five miles from the center of the city, and quick access to the airport is possible because of paved boulevards direct to the site.

The new port will be 3,000 by 3,000 feet, and will offer landing facilities for seaplanes as well as for landplanes. It is expected that the project will be completed in from ten to fourteen months.

TWO new airports are to be constructed at Lafayette and at Patterson, La. Both are local undertakings, being sponsored by organizations and prominent individuals.

Ground is being leveled and graded at Calumet Plantation, near Patterson, for that city's airport. The site fronts on the highway and is owned by H. P. Williams, who recently purchased a plane for his private use. A hangar and other modern facilities will be erected on the field.

THE *Times-Picayune*, New Orleans newspaper, has inaugurated a weekly airplane delivery service to its readers on the Mississippi Gulf Coast. Copies of the Sunday edition of the paper are taken Saturday night in a plane of the Menefee Airways, Inc., to Gulfport, Miss. There they are relayed by motorcycle to other towns along the coast.

City officials of Gulfport have laid plans to provide a new landing field in ninety days for this and other air activities.

ALLEN S. HACKETT was elected president of the New Orleans Airport Commission at its regular meeting held during the past month. Other officers elected are: Raymond Saal, first vice president; Col. George Hero, second vice president; Edwin Cook, third vice president; Sol Drapekin, fourth vice president; A. Adair Waters, secretary, and Max Scheinuk, treasurer.

Two contracts were let at the meeting for improvements at Callender landing field. One was for the erection of a combination rest house and postoffice, and the other was for the wiring of the field for radio beacons, floodlights and other purposes. The commission has petitioned Governor Huey P. Long and Senator O. K. Allen, head of the State Highway Commission, to establish a hard-surfaced road from the field to the city.

FIRST classes of the Menefee School of Aviation began during the first week of the new year, under the direction of Pat L. Higgins, world war flier and transport pilot. Eighteen students attended the initial session. The Menefee course includes ground training as well as flying instruction and covers the six branches of aviation instruction on which the Department of Commerce examines applicants for pilot licenses.

THE first women's class of the Southern Aeronautical Service, Inc., has been held in New Orleans. Thirty pupils of the feminine sex have enrolled in the school. Ellis E. Boggs, who is secretary-treasurer of the school, was the organizer of the St. Tammany Gulf Coast Airways.

The faculty of the Southern Aeronautical Service school is headed by Captain Robert H. Polk, as president and chief instructor. He is assisted by Lieut. A. J. Smith, U. S. M. C. Reserve, vice president and general manager; Walter Watson Van Benthuyzen; George Potter, formerly with the Curtiss company at Long Island; and Glynne M. Jones, who is in charge of student activity.

### New Orleans-Houston Air Mail Route Opens

ON January 23, the Gulf Air Lines, Inc., formerly known as the St. Tammany Gulf Coast Airways, Inc., inaugurated regular service on a six-day weekly schedule over the air mail route between New Orleans, Beaumont and Houston, Texas, (C. A. M. 29). Five-passenger Fokker Super-Universals with Wasp engines are being used over this route. The line connects with the New Orleans to Atlanta route operated by Gulf Air Lines.

Planes leave Houston at 8:45 a. m., Beaumont at 9:40 a. m., New Orleans at 1:00 p. m., Mobile at 2:35 p. m., Birmingham at 4:55 p. m., and arrive at Atlanta at 6:30 p. m. Flying in the opposite direction, planes leave Atlanta at 5:30 a. m., Birmingham at 7:10 a. m., Mobile at 9:30 a. m., New Orleans at 11:30 a. m., Beaumont at 2:25 p. m., and arrive at Houston at 3:15 p. m.

Over this route the company uses the following landing fields: New Orleans, Alvin Callender Field; Mobile, municipal airport; Birmingham, Roberts Field; Atlanta, Candler Field; Beaumont, municipal airport; and Houston, Houston Airport.

Since May 1, 1928, this company has carried more than 350 passengers between Birmingham and Atlanta. Eight airplanes are used and seven pilots and six mechanics are employed by Gulf Air Lines.

The fare from Houston to New Orleans is \$35, and from Houston to Atlanta \$85.

The officers of the company are: George Williams, president; Leslie L. Watson, vice president; Esmond Phelps, secretary-treasurer; W. N. DeWald, general manager; V. F. Grima, traffic manager.

### Selman Field

By Buckner H. Evans

OUTSTANDING among new airports in the Southern states is Selman Field, at Monroe, Louisiana. This new airport is a smooth, level landing field of 140 acres, upon which a fleet of forty of the Government's largest planes recently landed with ease. It is equipped with a spacious hangar, a powerful beacon and ample floodlights. A fully equipped repair shop is maintained for rebuilding, repairing and assembling airplanes, and there will soon be a school of aviation established here.

Selman Field supersedes an old airport at

Monroe, which was maintained primarily as headquarters for the Huff-Daland Dusters Corp. During the past month this corporation's dusting equipment has been bought by a local company, recently organized, called the Delta Air Service. The new company, headed by Mr. Travis Oliver, a Monroe banker and air enthusiast, will continue dusting operations in this territory.

Selman Field, named in memory of a Monroe aviator who lost his life in the service of his country, is owned jointly by the parish of Ouachita and its metropolis, Monroe.

## ALABAMA AIR NEWS

By ROBERT H. BROWN

ACCORDING to reports, a bill will be presented at the next session of the state legislature providing for a tax refund of aviation gasoline.

FLOODLIGHTS are to be installed at Roberts Field, Birmingham, in the very near future. The approximate cost will be \$7,500. The field now has obstruction and boundary lights.

A BEACON has been erected by the Alabama Power Co., at Jordan Dam, between Birmingham and Montgomery. The beacon will be marked "J" on all air maps and will flash that letter in Morse code.

AIR markers have been placed at three Alabama towns. They are: Florence, Jasper, and Haleyville.

THE Selma airport is reported to be in good condition after grading and installation of lights. The road between Selma and the airport also has been improved.

BRANCH offices of the South American Trade Extension Flight are to be opened in New York and Chicago. Robb C. Oertel and W. O. Browne will be in charge of the New York office. The Chicago office will be under the management of Orin Welsh. Main offices of the flight will still be located at Birmingham, however.

The Trade Extension Flight is being planned to tour the Latin-American countries to promote better relations with this country.

## VIRGINIA AIR NEWS

WHEN Col. Charles A. Lindbergh, Harry F. Guggenheim, Gov. Harry F. Byrd and Henry G. Shirley, state highway commission, made their hunting excursion in Virginia during December, they landed in their Loening amphibian at Valley Airport, Waynesboro. They flew to Waynesboro from Richmond in the morning, hunted during the day, and returned to Richmond late in the afternoon.

Valley Airport at Waynesboro has been developed mainly through the efforts of C. C. Loth. The field is in good shape, but the road leading to it is in poor condition. Every effort is being made to have the road improved as soon as possible.

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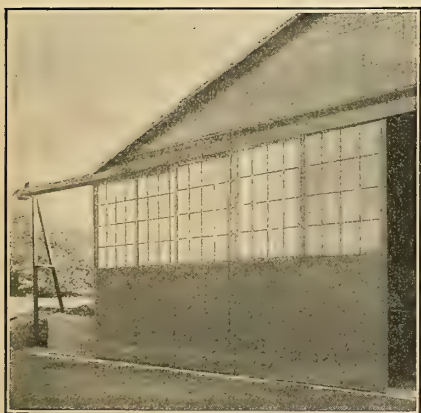
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# TRUSCON HANGARS AND STEEL DOORS



## TENNESSEE AIR NEWS

## Chattanooga Notes

By James S. Lindsey

A REPRESENTATIVE from the Department of Commerce is to arrive in Chattanooga about February first to inspect the localities chosen for a municipal airport by the committee in charge of the aviation bond issue of \$250,000. Building will commence immediately after the inspector has chosen the site. The present port, Marr Field, is considered out of the question for an airport because of smoke and fog there which seriously affect visibility. This field is also unfavorably located in relation to the city and the surrounding mountains.

Due to the condition of Marr Field, the Interstate passenger service has been discontinued until an airport is established. Mail service, however, is regular.

THE Chattanooga Savings and Trust Co. has installed a rotating searchlight and is about to install a new stationary beacon which will be directed toward the airport.

Lookout Mountain Hotel also maintains a 2,500,000 candlepower revolving light. It is said to be the highest light of its kind in the world, being at an elevation of 2,700 feet. This light is in operation only during the summer months. Lookout Mountain might furnish a dangerous obstacle to night fliers without this light sending out its warning. It has a 150-mile radius and revolves every 3 minutes.

## Memphis Notes

By Charles Eugene Fisher

REGULAR air mail service and passenger routes, a total of 400 trained pilots, a new aero clubhouse, the opening and operation of a first rate municipal airport, the possibility of a large airplane factory, and an active national guard unit are the new year promises of Memphis' aerial leaders for 1929.

Work on the new municipal airport, a 210-acre field, is progressing rapidly. It is located at Hollyford Road, 20 minutes' drive from Main Street. It is being leased by the city government for \$100 a month.

BAUGHAN AIR COLLEGE, operating Parl Field near Millington, Tenn., near Memphis, opened on October 22 of last year and now has more than 35 students on air work, exclusive of ground school classes.

Officers of the Baughan company include Charles Baughan, general manager; Jack Walters, sales manager; Harry E. Bovay, financial backer and advisor; Rudolph Anger, instructor; and Charles W. Albert, superintendent of operations. The company is agent for Stinson-Detroiter, and Stinson Junior and Command-Aire planes.

THERE are 75 student fliers at New Brys Aviation Field, Raleigh Road, Memphis, operated by the Tri-State Airways Co., which also operates schools at Jackson, Tenn., Greenwood, Miss., and Oxford, Miss.

The Tri-State company is agent for Curtiss, Eaglerock and Buhl planes. Included among the officers are: H. T. Dawkins, president; Capt. Jess Windham, chief pilot and instructor; Pat Barron and Earl Hughes, pilots and instructors; and Charlie East, pilot.

CAPT. VERNON C. OMLIE, president of Mid-South Airways, operating Armstrong Field on North Second Street, near Memphis, says that his company has sold through its Memphis office, 18 planes in 1928 and turned out 35 students and now has 40 enrolled.

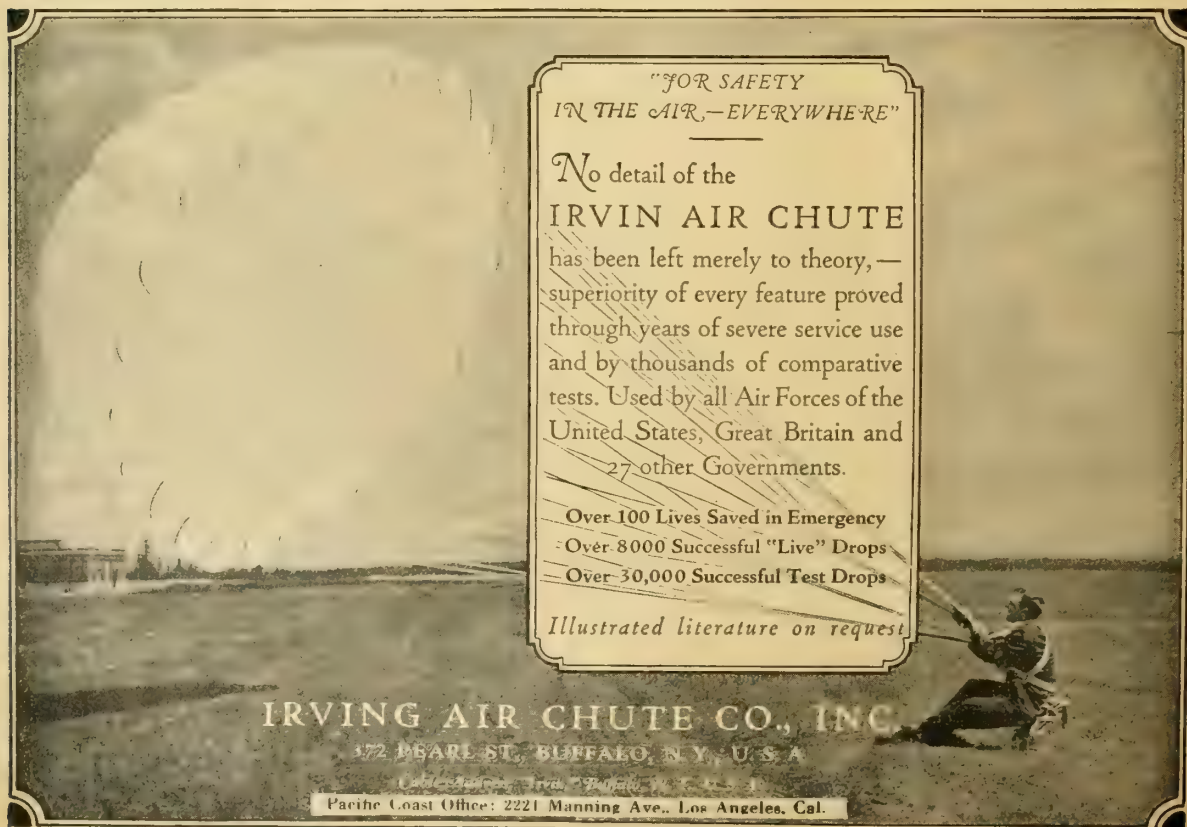
Mid-South Airways has agencies for Waco, Monocoupe, Stinson-Detroiter and Stinson Junior planes. Other officers of the company include Mallory Chamberlin, vice president; Mrs. Phoebe Fairgraves Omlie, secretary; Jack Nelson, treasurer; and K. E. Yoder, pilot and instructor.

## Nashville Notes

By Virginia Matthews

PASSENGER service has been discontinued at Nashville by the Interstate Airlines, Inc. However, air mail service will continue.

THE Nashville airport is still in an unfinished state. The state legislature convening this month will be asked for power to complete the field through the purchase of additional ground and installation of sufficient equipment.



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In airplane manufacture there can be no substitute for experience. The only men who have a hand in the design and construction of Cabinaire planes are men who have been doing day-in and day-out flying for the past 16 years. As a result of this, Cabinaire meets every demand for a small cabin biplane. Because of its exceptional stability, performance, ruggedness, and ease of control, Cabinaire has found a definite place in the small cabin biplane field.

Not only has the rule of experience been applied to the design and construction of Cabinaire, but the heads of various departments, salesmen, etc., are men who have been chosen because of their close and permanent association with the aircraft industry during and since the War.

Standard Cabinaires are powered with a Warner Scarab 110-H.P. motor, which gives them enviable and dependable performance. Cabinaire has ample visibility—far more than most cabin jobs. Cabinaire comes equipped with Aerol struts and Bendix self-energizing waterproof brakes. People who have flown and ridden in Cabinaire, have remarked about the exceptional comfort, leg room, head room, and ample baggage accommodation. People who have seen Cabinaire remark about its dazzling finish, lustre, and style.

Cabinaire sells for \$7,200.00, fully equipped. Equipment includes Cabin heater, exhaust ring, windshield wiper, rugs, upholstered wicker chairs, velour finish on interior of cabin, nickel door trim, Standard Steel Prop, Consolidated control panel. Due to our ample production facilities, we are now in position to make immediate delivery, in lots of from 1 to 10.

### SPECIFICATIONS

#### Cabinaire 4-Place Cabin Biplane

Dimensions		Capacity and Useful Load		Performance	
Span Upper Wing.....	34 ft. 9 in.	Seats pilot and three. Normal payload, 3 passengers and baggage.....	908 lbs.	High speed (sea level) .....	103 M.P.H.
Span Lower Wing.....	29 ft.	Weight empty .....	1,300 lbs.	Stalling speed .....	38 M.P.H.
Total Wing Area (including		Total weight loaded.....	2,208 lbs.	Cruising speed .....	90 M.P.H.
Allerons) .....	322 sq. ft.	Fuel Capacity Data		Rate of climb at sea level (feet per min.) .....	750 ft.
Height .....	9 ft.	Gasoline (2 tanks in upper wings, 21 gals. each) .....	42 gals.	Service ceiling .....	12,000 ft.
Length .....	23 ft. 9 in.	Oil .....	4 gals.	Cruising range .....	465 mi.
Wheel Tread .....	7 ft. 6 in.				

We have a profitable distributors' franchise open in several good territories. If interested, write for full detailed facts and figures.

## PARAMOUNT AIRCRAFT CORPORATION

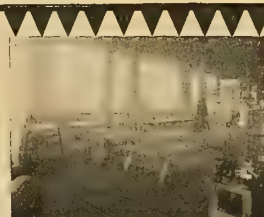
Saginaw

Dept. AD-2

Michigan

### Approved Type Certificate

Request for Approved Type Certificate from the Department of Commerce was made October 25, 1928. Receipt of this Certificate is expected shortly.





## FORT WORTH NOTES

By JAMES CALVERT

A NETWORK of passenger airlines covering every population center in the state of Texas is to be established soon by the T. A. T. Flying Service, Inc., a subsidiary of Texas Air Transport, Inc.

The lines, eight in number, will be opened as soon as equipment can be procured. E. G. Rhenstrom, formerly with the Fairchild Airplane Mfg. Corp. of New York, has been selected as operations manager.

Two of the lines will follow the mail routes now operated by Texas Air Transport, Inc. They are from Fort Worth and Dallas to Waco, Austin, San Antonio and Laredo, and from Fort Worth and Dallas to Waco, Houston and Galveston. The other proposed lines will be between Fort Worth and El Paso, with intermediate stops yet to be determined; Fort Worth and Dallas and Amarillo, by way of Wichita Falls; Fort Worth and Texarkana; Amarillo and San Antonio; Houston and San Antonio, and San Antonio and Brownsville.

Travel Air cabin jobs, powered with Wright J-6 motors, will be used on the lines. In addition, the service will maintain a parts depot and a flying school in each of the cities named.

The central office for Texas Air Transport, Inc., is at Fort Worth, and it is probable headquarters for the T. A. T. Flying Service, Inc., will be located here also.

MORE than 40 newspaper men and chamber of commerce executives of Texas attended the "flying school" sponsored by the Texas Air Transport, Inc., at Fort Worth, January 14 and 15.

They were explained aviation problems in order to write intelligently about matters pertaining to aviation.

Rides over the city opened class activities. Later they heard lectures on airplane nomenclature, aerodynamics, air mail operation, meteorology and various other subjects pertaining to aviation.

The school was in charge of Jerry Marshall, former air mail pilot and now head of the flying school conducted by Texas Air Transport, Inc.

## SAN ANTONIO AIR NEWS

By GENE SMITH

ESTABLISHMENT of an inland customs port at Winburn Field, municipal airport of San Antonio, is being sought by Mayor C. M. Chambers in an application to the United States Secretary of the Treasury.

THE Mexican air mail route from Nuevo Laredo to the City of Mexico will be operated at an early date under a private contract instead of by government planes as at present. This line connects with the southern terminal of the United States-Mexico line at Laredo, Texas.

Following bitter protest of the reported abandonment of this line in favor of a new connecting link from the City of Mexico to Brownsville via Tampico, General Edu-

ardo Hay, former secretary of the Department of Communication in the Calles cabinet, assured San Antonio officials and business men that the Laredo route will be continued under private contract. The City of Mexico-Brownsville route also is to be carried on by private contract with the Compania Aviacion Mexicana (Mexican Aviation Company).

The Mexican government originally intended to discontinue the Nuevo Laredo line because it was being operated at a loss, due to lack of interest growing out of a 20-hour layover of the air mail at Nuevo Laredo. Under the new contract, this delay will be eliminated by a revision of schedule.

## DALLAS AIR NEWS

By CAPT. W. H. SCOTT

ANNOUNCEMENT was made here by C. E. Harmon, vice president of the Dallas Aviation Industries, that a Canada-Mexico passenger airline is in course of formation. The line will pass through Dallas and Fort Worth.

The corporations forming the line are the Southern Airways, San Antonio; the Rapid Airlines of Rapid City, South Dakota, and the Dallas Aviation Industries of Dallas. Leaders in the movement are C. G. Spence and Clyde Ice of Rapid City; Capt. W. F. Long, Dallas; L. A. Winship, president of the Southern Airways of San Antonio, and Christie Bryan of St. Louis. Ford all-metal planes of the trimotor type will be used, and freight will be carried as well as passengers.

ARTHUR J. REINHART, president of the Dallas Flying Club, is asking the Government to spend \$200,000 for new hangars and improvements for the new Dallas army airport at Grand Prairie. The new field will be turned over to the Government late in February following the building of hangars, for which money has been provided by the Dallas Chamber of Commerce. This will give Dallas two airports—Love Field, on which there are 20 hangars, and the new field which will be devoted to army and air mail activity. The new field has a 16-room clubhouse and will have at least 12 hangars.

A NEW hangar has been purchased for the Dallas Aviation Industries, making five hangars now in use by this firm. There is a long waiting list of firms wishing use of hangars now occupied by the U. S. Air Corps, which will move from Love Field to the new field.

THE Wichita Falls Air Transport Company opened its new line from Wichita Falls to Dallas late in December, carrying over 30 passengers on the first trip. One plane is flown daily.

STANDARD AIRLINES of California will extend its line from Douglas, Arizona, to Dallas in the early spring. Universal Air Lines System also has announced a new line from Dallas to St. Louis and Louisville. Paul Brainiff, of Oklahoma City, is fostering a line from Dallas to Oklahoma

City, Tulsa, and Ponca City, with other stops at Muskogee and Fort Worth.

MAJOR JOSEPH H. NOYES, commander of the 366 Observation Squadron Air Reserve, has joined the Treasury Department, Aviation Section, and is stationed at San Diego, Calif. He will continue to act as national commander of the Aviation Cadets of America.

MAJOR F. H. BLAKE, Fort Worth, has been appointed to command the squadrons of Aviation Cadets at Fort Worth. Paul Rester is cadet commander and Frank Swanner is cadet adjutant. Over 75 high school students are in the squadron. Cadet Major Jerome Blount will form another squadron at Central High School. Examinations for rookie membership take place every month at the Fort Worth Association of Commerce.

O. P. ECKLES, of Dallas, has invented a new airplane engine of the semi-rotary type, the model of which is now being made in Cleveland, Ohio.

DURING the past year, Travel Airways has sold 40 new production ships, trained 35 students, and covered 1,800 hours of flying time in cross-country trips to various parts of the United States. All of this was carried out without the slightest accident to a student, pilot, passenger or ship. Howard Woodall and C. W. Shaw are joint managers.

## HOUSTON AIR NEWS

THE new Edwards Airport, which contains 200 acres, is located six miles from the heart of Houston on the new Main Street Highway which leads to San Antonio. Mr. W. L. Edwards, owner of the airport, has had erected one Notrus hangar of the United States Department of Commerce Class B type and has just awarded a contract for the construction of another Notrus hangar of the Class A type, which will be able to accommodate several trimotor ships. The hangar is 102 feet by 100 feet, with doors at both ends. Mr. Edwards also plans to erect a group of individual hangars which have just been contracted for with the Notrus Hangar Corporation of Houston. An office with rest rooms, a workshop with sleeping quarters for mechanics, and a filling station are now in operation.

The Texas Company makes the Edwards Airport headquarters for its Ford-Stout, Lockheed Vega, and fleet of other ships.

## TEXAS AIR NEWS

GEORGE B. FREDELL, traveling sales manager for Texas Pacific Aero Motor Oils, with V. N. Johns as pilot, has flown since June, 1928, nearly 28,000 miles on business trips. During that period, according to an accurate check on the operation of the plane, the Ryan Brougham in which he flew has averaged about 100 miles per hour and has consumed fuel at the rate of 10 gallons per hour.

# *“Air builders... of what do you build?”*

*Only the most modern, scientific finishes can master the sky*

**F**INISHING materials adequate for my lady's dressing table are not built to stand the gaff of the air. An aeroplane is built of special materials. It must undergo conditions of wear—sudden changes in temperature, stresses and strains from which even the most severely-used automobile or locomotive is immune.

Today du Pont offers makers of aircraft, finishes that are new, unique—the ultimate achievement of modern chemistry. Du Pont Wing Dopes and other special products are built to protect and beautify every surface of

your ships against the worst that heat, cold, sun and weather can do—long after other materials have suffered the fate of all unfit things.

Every du Pont aircraft finish has been tested—both in laboratory and in the most gruelling flying service.

*Now—Utilize Style and Color  
to the Full*

Du Pont brought color to the motorcar and the home. Now you can take advantage of this additional asset—the powerful modern selling appeal

of style. Du Pont shades and tints are authoritative. They have been studied by optical experts and meet your special requirements of visibility.

Say “du Pont finishes” to your prospect and that part of your selling job is done.

The stylists of du Pont Color Advisory Service are in constant touch with trends in the aviation field, both in America and Europe. They will be glad to suggest harmonies specially suited to the air. In solving your finishing problems, call on them as well as on the du Pont technical experts.

**Du Pont Paints and Varnishes:** Du Pont chemists have developed a complete line of paints and varnishes including Dope-proof Paint, water resistant Spar Varnish and engine finishes.

**Du Pont Wing Dope:** The du Pont line of nitrate dopes includes several tested formulas remarkable for build and durability. Impermeable, airproof, hard yet flexible, remarkably resistant to violet rays. Available in a wide variety of highly visible colors.



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## DALLAS AVIATION SCHOOL, INC., DALLAS, TEXAS

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L. H. Luckey, Chief Pilot*

# WE TRAIN YOU FOR ANY POSITION IN AVIATION

**C**HOOSE the position you want! Private pilot, commercial pilot, transport pilot, student instructor, mechanic, airport manager, repairer or builder of airplanes, or airplane salesman. Thousands of places yet to be filled all over the nation. More chance of advancement in aviation today than in any other business on earth and it takes trained men. Get ready for your place in aviation—enroll now. We will show you the way.

We save you time and money. Our prices are low. No snow or blizzards—ideal weather conditions. We fly every day—no lost time. Board and room at the field, \$8.00 to \$10.00 per week. Street car and bus service 18 hours a day, every 30 minutes, to the city. Two mail deliveries each day. We have everything in your favor HERE. Save one-third to one-half on your course in time and money.

*Average Temperature in 1928—August, 87°—December, 67°*

### CLASS INSTRUCTION

Two evenings each week are devoted to instruction from text books and lectures by aviation experts.

### AIR NAVIGATION AND METEOROLOGY

We have engaged the services of Mr. Phil Lampert, graduate of Annapolis Naval Academy, as instructor in air navigation, astronomy and meteorology.

### CITY OF DALLAS

Dallas is a metropolitan city of 300,000 population and is one of the most progressive and up-to-date cities in the country. The people here are air-minded and will welcome you. The Dallas Chamber of Commerce joins in our invitation to you to come here and learn to fly.

### INSTRUCTION

Each student pilot is given personal and individual training at all times. Government rules and regulations are followed. More than 200 airplanes visited our field last month.

### OUR STUDENTS

We now have students here from 35 states and our enrollment is growing every day.

### EQUIPMENT

We have an abundance of equipment in first class condition and we keep it that way.

### HANGARS AND SHOPS

We have more than 50,000 square feet of hangar and shop space, filled with equipment, supplies and airplanes.

### TEN YEARS

Safe, sane flying and student instruction without a single fatality.

### OUR INSTRUCTORS

Are all Government Transport Licensed Pilots and have been with us a long time.

### ARMY AIR CORPS RESERVES

Two active reserve squadrons of the U. S. Army Air Corps operate off this field. Many of our students who are qualified join these organizations and by applying themselves to this work, can obtain commissions in the Army Air Corps Reserves.

### OUR GUARANTEE

If you come here you will not be disappointed. You will have advantages here that are not found elsewhere. We guarantee to teach you to fly in the shortest possible time.

If you are not prepared to go ahead with one of the larger courses, take a shorter course. But in any event get started.

Uncle Sam trains more army fliers in Texas than in any other state. There is a reason. Ask anyone who knows.

### AFFILIATED COMPANIES

Dallas Aviation Industries, Inc.

*Wholesale and Retail  
Airplanes and Supplies  
Distributors of Eaglerock, American  
Eagle, Swallow and Curtiss airplanes.*

Southern Airways, Inc.  
San Antonio, Texas

*Write us for further information.*

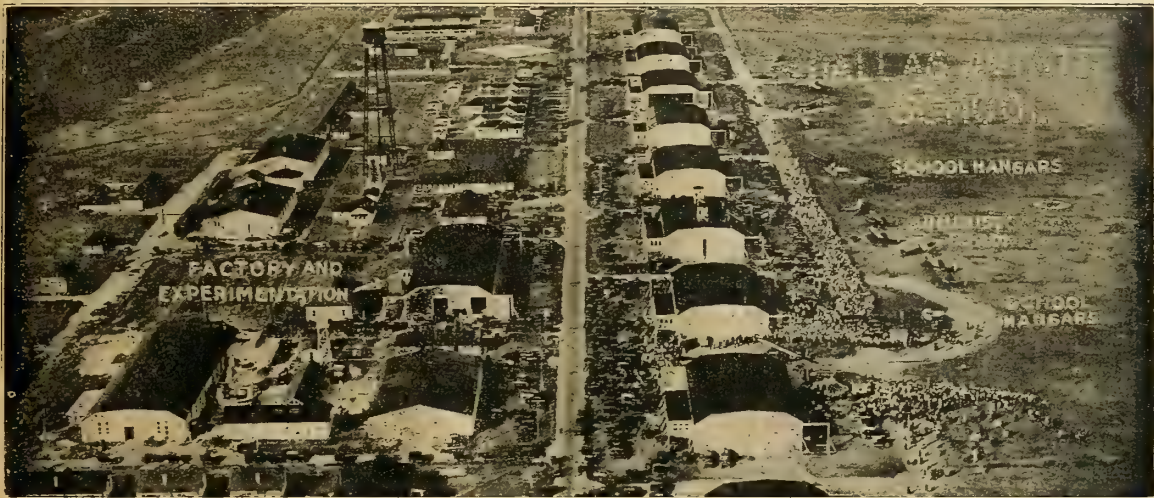
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Our flying field and airport, built by U. S. Gov't, for training world war flyers

LARGEST FLYING SCHOOL IN THE SOUTH—COMPLETE COURSES IN AVIATION

Prices for Student Pilot Courses:

PRIMARY COURSE

Ten full air hours; dual instruction class. Instruction includes motor mechanics and ground work. Average student will solo in this course. Time required, 10 days average. Price . . . \$150

ADVANCED COURSE

Includes primary training, 15 air hours, solo flying, cross-country flights, ground work. Class instruction, no bond required. Time required, 18 days average. . . . . \$250

PRIVATE PILOT'S COURSE

20 hours flying time and training, qualifying student for Private Pilot's License; 10 hours, solo flights, no bond. Very popular course; average time, 24 days . . . . . \$325

COMMERCIAL COURSE

50 hours in the air, everything in flying, qualifying student for limited commercial pilot's license. Enroll for this course; average time, 50 days . . . . . \$750

TRANSPORT PILOT'S COURSE

Everything in flying; cross-country flights, acrobatics, meteorology, air navigation, 200 air hours, qualifies pilot for Transport License. Position if ability is shown; average time, 5 months . . . \$2,000

GROUND COURSE

3 months training in motor mechanics, shop work, repairing. \$1.00  
You can enroll any time and training starts on day of arrival.  
Physical examinations HERE.

SPECIAL OFFER

For month of February

Transport Course, price . . . \$2000;  
or Commercial Course, price . . . \$750.

And we will pay your railroad fare from any point in the U. S. to Dallas if you come by train or drive your car through. This is the best proposition that we have ever offered and is not equalled anywhere. This offer has been extended from January to accommodate many students who will come this month. Enroll at once. Our President, Capt. W. F. (Bill) Long says—

*"If you want to learn to fly, now is the time and I invite you to come here and we will teach you the right way. I have trained hundreds of pilots during the past ten years and some of them are holding the best jobs in the country today. We have everything to your advantage here and I guarantee to teach you to fly better than at any other point in the U. S."*

(Signed) W. F. Long,  
Capt. U. S. A. C. R.

REFERENCES:

Mercantile National Bank, Dallas, Texas  
Chamber of Commerce, Dallas, Texas



## NEW YORK AIR NEWS

### New York Important in Aircraft Industry

A RECENT report of the Merchants' Association of New York reveals some interesting statistics regarding the aircraft industry in the New York metropolitan area. According to this survey, the companies in this district produced, in 1927, twenty-nine per cent of the total aircraft of the entire country. In the same year, there were in this district sixteen aircraft factories and two engine plants, nine of which did both manufacturing and experimental work. There were seven concerns producing accessories and fifty producing various articles used in aviation. The value of aircraft and engines produced in the New York district during 1927 was \$9,000,000, the value for the United States being \$20,783,733. In 1927, a total space of 848,140 square feet was used in airplane and accessory manufacture. The average number of workers employed was 2,739.

The same report shows that, in 1927, eight aircraft companies located at Buffalo had a total output valued at \$5,000,000; the products of seven aircraft and six engine companies at Detroit were valued at \$3,500,000; and the production of aircraft at Los Angeles amounted to \$2,750,000.

THE Paramount Welded Aluminum Products Corp., of Brooklyn, N. Y., manufacturer of airplane fuel and oil tanks for the past eleven years, has moved its plant and office from 429 Kent Avenue to 195 Morgan Avenue. The company now occupies 14,000 square feet of working floor space.

Increased sales, which have doubled in the past few months, and recent contracts for large quantity production are the cause of this expansion, the third in a period of slightly more than one year.

The Paramount company manufactures fuel and oil tanks for Army and Navy contracts, besides building for commercial production. All tanks are manufactured as per the specifications or blue-print submitted. J. Billig is president of the corporation.

D. W. FLYING SERVICE has recently been established at LeRoy by Mr. Donald Woodward. The airport consists of 140 acres and has four runways of crushed stone, 100 feet wide and ranging in length from 2,600 to 3,300 feet. A hangar, which measures 100 x 140 feet, has been constructed at the field by John B. Pike and Sons, Inc. Adjoining the hangar are accommodations for school, offices, and workshop.

The operating personnel of D. W. Flying Service includes Capt. Russell Holderman, manager of the airport; Lou Gordon, co-pilot on the transatlantic flight of the *Friendship*; Otto Enderton; and Roy Duvall.

THE General Airplanes Corporation of Buffalo, which turned out the first Aristocrat monoplane as recently as July, 1928, is now operating at full swing and will during the coming year increase its activities. During the Chicago show in December, the company booked orders amounting to more than \$450,000 and arranged for dealer distribution

of GAC planes throughout the country.

At present twenty-one persons are employed in the engineering department of General Airplanes Corporation. A. Francis Arcier is vice president in charge of engineering. Since 1912, Mr. Arcier has been active in aviation both in Europe and America.

G. MacLean Gardner is vice president in charge of manufacturing. During the World War, he was engaged in the manufacture of British aircraft.

JESS I. MENEFEE recently joined the staff of Barrett Airways, Inc., of Armonk, Westchester County. Mr. Menefee has been actively engaged in aviation for eleven years and has a total of 3,500 flying hours to his credit.

MR. IGOR SIKORSKY, vice president and chief engineer of the Sikorsky Aviation Corp., together with Henry J. White, chief pilot, is touring several European countries to study aviation abroad.

The new Sikorsky plant at Bridgeport, Conn., which will greatly increase the company's production facilities, will begin operations when the first unit is completed, probably in about six months. With the new plant operating, the Sikorsky company will have a production schedule of approximately 100 amphibians per year.

### Curtiss Caproni, Inc.

CURTIS CAPRONI, INC., has been formed for the construction in this country of seaplanes and airplanes under the designs and rights of the Societa Aeroplano Caproni, of Milan, Italy.

The Caproni company is one of the best known designers and manufacturers of large airplanes in Europe.

Both the Caproni company and the Curtiss company will own substantial interests in the new organization.

AFTER six months of research and study of the lubrication requirements of aircraft engines, the Hartol Refining Corp. of New York City has developed two grades of oil, one for water-cooled and the other for air-cooled engines. The Hartol company plans a nation-wide distribution of these specialized aviation oils.



Paul Wadsworth Chapman, owner of the Burnelli monoplane airliner

THE U. S. Rubber Company, manufacturer of many items of rubber materials used in the construction of aircraft and aircraft engines, has appointed Leslie Hull as manager of its aviation division. Mr. Hull is one of the Early Birds who took his first training under Glenn Curtiss at Hammondsport.

### Consolidated Merges with Two Companies

THE Consolidated Instrument Company of America, Inc., has acquired the controlling interests in Julien P. Friez and Sons of Baltimore, Md., and the Molded Insulation Company of Mount Vernon, N. Y.

The Friez company, which will continue to operate under its own name, has been manufacturing meteorological instruments for more than fifty years. About ten years ago, the company began producing aeronautical precision instruments, and more recently, has been designing meteorological instruments for airport needs.

The Molded Insulation Company has engaged in the manufacture of Bakelite products,—particularly Bakelite parts for precision and meteorological instruments.

NORTH AMERICAN AVIATION, Inc., recently purchased the Sperry Gyroscope Company, manufacturer of aeronautical and navigational instruments and equipment. The Sperry company specializes in the development and production of gyrocompasses, gyro-pilots, group gunfire, searchlights and gyro devices for the control of airplanes.

### Nicholas-Beazley Supply Depot at Curtiss Field

THE fourth depot of the net work of aeronautical supply depots being established by the Nicholas-Beazley Airplane Co., Inc., of Marshall, Mo., has been located at Curtiss Field by the Ireland Aircraft Company of Garden City, L. I.

This depot will be a separately maintained and operated organization operating under the management of the Ireland Aircraft Company. A complete and representative stock of all aeronautical supplies, parts and accessories will be at the hangars and warehouses on the flying field. The stock has already been placed on the shelves ready for sale. It is planned to have a complete service department operated in connection.

HAROLD and David Caminez are in Europe making a survey of the aeronautical industry abroad. During their absence from the United States, their brother, Leon Caminez, is in charge of their affairs.

AIR ASSOCIATES, INC., of New York City, has appointed Mr. Russell Simpson of Hollywood, Calif., as dealer for Avro Avians in Southern California.

CAPT. ARCHIBALD JOHNSTON has been appointed sales manager of the Moth Aircraft Corporation, New York City. During the war, Capt. Johnston served both in the Lafayette Escadrille and in the United

(Continued on next page)



Serving the  
Service !

EARLE OVINGTON  
CONSULTING ENGINEER  
SANTA BARBARA, CALIFORNIA

PL. 1000 BUREAU 1928

For 46, 1928

Burroughs Wellcome & Co.,  
11 East 41 St., New York.

Gentlemen:

Noting your recent advertisements in the aviation journals, I thought that you might be glad to learn that the Burroughs Wellcome first air outfit which you presented me when I carried the first U.S. air mail, Sept. 23, 1911, is still unused and in my travel air plane which I fly all over the country. It is my seventh airplane.

I fly for pleasure only, now, and almost never go outside of town in any other conveyance than my airplane -- it's too risky to use the highways these days!

Wishing you the success in the future that you have had in the past and which you so richly deserve, I remain,

Very truly yours,  
Earle Ovington

Protection

'TABLOID'  
FIRST-AID  
PRODUCTS

'Tabloid' First-Aid was carried as an important feature of the equipment of the pioneer U. S. Mail Plane Flight in 1911 and is to-day still serving the service.

Another demonstration of its time-honored acceptance as the standard First-Aid necessity.

BURROUGHS WELLCOME & CO., (U. S. A.) INC.  
9 & 11 EAST FORTY-FIRST STREET, NEW YORK CITY

Associated Houses:

LONDON (ENG.) MONTREAL SYDNEY CAPE TOWN MILAN  
BOMBAY SHANGHAI BUENOS AIRES

"Keep your 'Tabloid' First-Aid complete by maintaining a reserve supply of refills."



Please send me A. D.

'TABLOID' FIRST-AID Booklet

Firm Name.....

Address .....

Individual's Name.....

Official Capacity.....



(New York Air News continued)

States Army Air Corps. He is the author of several books on aviation.

William R. Ostertag, a graduate of the Naval Academy, has been added to the sales staff of the Moth company.

#### New Courses at Guggenheim School at New York University

TWO new courses are being offered during the second semester at the Daniel Guggenheim School of Aeronautics at New York University. The study of the economics of air transportation is being conducted by Prof. Myron W. Watkins, and the study of air transport as it relates to lighting, weather service, radio, flying equipment, etc., is under the direction of Capt. C. H. Biddlecombe.

Seniors and graduate students at the Guggenheim school are eligible to compete in the Wright company's plane design contest, which closes May 11. Designs submitted must cover specifications on a cabin airplane powered with a 150 horsepower 5-cylinder Wright Whirlwind engine.

THE "Bird" Biplane manufactured by the Brunner-Winkle Aircraft Corporation of Brooklyn, New York, was the first to pass the new requirements of the Department of Commerce for the approved type certificate. The certificate awarded is number 101.

The production of the "Bird" will be 300 planes for this year. The factory is now working on orders previously placed and increasing the output of its assembly line to meet the big spring demand.

#### Scintilla Magneto Co. Completing New Construction

TO meet the constantly increasing demand for its aircraft magnetos, the Scintilla company has added to its present 40,000 square feet of manufacturing space, another factory building of brick and steel construction, which is rapidly nearing completion. When this space is available, the manufacturing and office facilities will total 80,000 square feet.

The most modern automatic machinery is being transferred from the old building to the new, augmented by specially designed machine tools that will do much toward the reduction of manufacturing costs.

Production of Scintilla aircraft magnetos at the Sidney factory has attained a rate of 1,200 units per month, but with the new building and its machinery available, the production schedule for the coming year has been set at 2,000 per month.

In addition to these magnetos, the delivery schedule calls for 1,000 units per month, of the three, four, five, six and seven-cylinder types, which are imported and in all instances carefully inspected and tested.

A. T. LEBLANC has joined the aircraft division of the manufacturers sales department of the Robert Bosch Magneto Company, Inc., Long Island City, N. Y. Mr. LeBlanc was sales manager of the Eisenmann Magneto Corporation for many years and until recently has been the manager of

the Philadelphia branch of, the Hahn Motor Truck Corporation.

TO handle properly the rapidly increasing volume of airports work Black & Bigelow, Inc., air transport engineers of New York City, has created an Airports Division of its staff.

This company was recently awarded the contract for all engineering and design work for the Central-Airport, Camden, N. J., and is also handling the site selection and field work for Aviation Country Clubs.

THE Eclipse Machine Company of Elmira has acquired the patent proprieties relating to engine starters of the Aeromarine Companies of Keyport, New Jersey. The Eclipse company will, hereafter, service the aviation engine starters heretofore manufactured and sold by the Aeromarine Companies.

#### Colonial Airways 1928 Operating Figures

A TOTAL of 658,868 miles have been flown by pilots of the Colonial Airways System since the formation in 1926 of the first of the three companies comprising the system, according to figures compiled up to January 1 by officials of the organization. During this period 9,487 passengers were flown and 164,727 pounds of mail were carried over the Boston, Cleveland and Montreal runs.

Pilots of Colonial Air Transport, which operates the Boston-New York run, have flown 364,639 miles, carried 4,749 passengers and transported 82,514 pounds of mail. The 1928 mail total on this line was 55,708 pounds, an increase of 35,533 pounds over 1927.

Canadian Colonial Airways, running between New York and Montreal, reports a total mileage flown of 58,212 miles, and 36,600 pounds of mail and 280 passengers carried since operation started October 1.

Colonial Western Airways, operating between Albany and Cleveland, has flown 236,017 miles, carried 4,458 passengers and transported 45,613 pounds of mail.

EXPORT sales of airplanes totaling \$193,000 in one week, which is more than twice as much foreign business as the entire American aeronautic industry did in all of January two years ago, were recently made by the Fairchild Airplane Manufacturing Corp., of Farmingdale, L. I.

Eight stock Fairchild monoplanes of the high-wing cabin type, with spare parts and accessories, are represented by the \$193,000 sales figure. Three were bought in Canada by the Dominion Explorers, Ltd.; two in Mexico, by the Compania Mexicana de Aviacion; and one each in Peru, by the Peruvian Airways, Inc., Chile, by the Chilean Airways, Inc., and Costa Rica, by the Pan American Airways, Inc.

ON January 7, air mail service was established at Rome, N. Y., on CAM 20.

WILLIAM F. GOGGINS has been appointed assistant secretary and treasurer, and James A. Bowers, assistant chief

engineer of the Consolidated Instrument Company of America.

FORTY-THREE oil temperature indicators have been manufactured by the Moto-Meter Company for installation in the \$700,000 worth of airplanes now being built by the Curtiss Aeroplane & Motor Company for the government of Chile. The dials on the indicators are printed in Spanish.

MISS CLARA WIDGER, former librarian for the Aeronautics Division of the Department of Commerce, Washington, D. C., has been engaged by the Fairchild Aviation Corporation at Farmingdale to install a complete aeronautical reference library for the convenience of the Fairchild employees.

In this library will be found every patent on aircraft ever filed in the U. S. Patent Office. It will contain all aeronautical and engineering reference books, as well as magazines.

ROCHESTER MUNICIPAL AIRPORT has recently undergone several much-needed improvements. A concrete and steel hangar, with a twelve-plane capacity, has been erected. On a steel tower beside the hangar, a General Electric rotating beacon has been installed. Obstacle and runway lights have been provided. Several cinder runways have been laid out, and a drainage system has been installed.

Gareth O. Clark is manager of the airport.

APPROXIMATELY 50 students are taking instruction under Capt. Merrill K. Riddick at Rouse-Partridge Field, Rochester. Two Eaglerocks and a Silver Lark comprise the flying equipment. An eight-plane hangar is being constructed at the field.

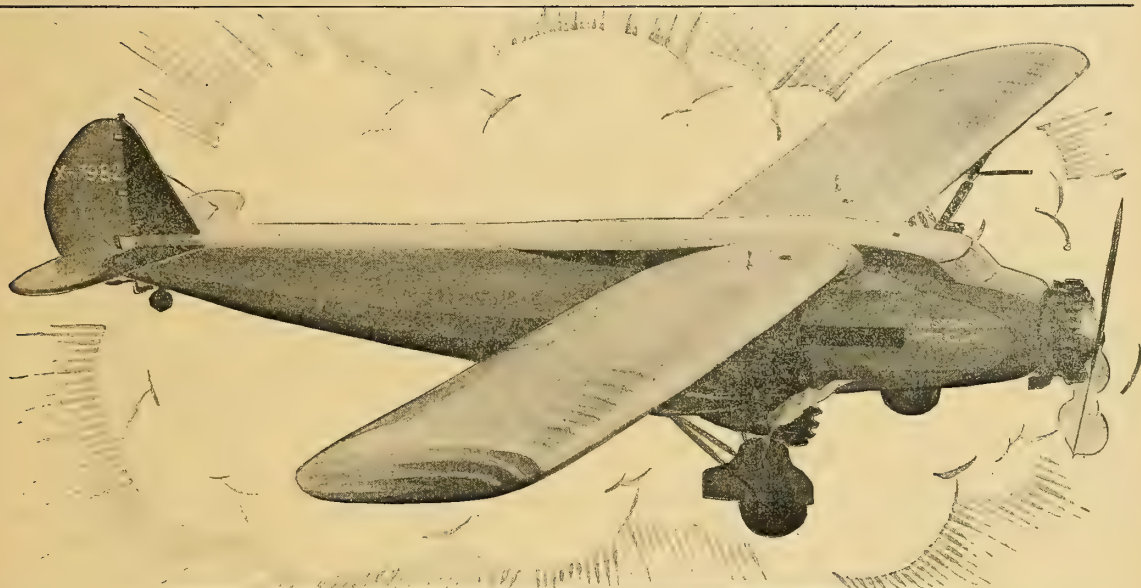
DURING the New York Automobile Show, the trimotored plane of Aerial Advertising, Inc., flew over New York City nightly, carrying on its 95-foot lower wing the sign "Cadillac-LaSalle" flashing on alternately with "Hit of the Auto Show."

The flying sign was illuminated with Claude Neon lights, requiring an electric current of 7,000 volts which was generated by wind-driven dynamos.

THE Consolidated Instrument Company recently received an order for 500 complete airplane instrument boards from the American Eagle Aircraft Corp., of Kansas City, Mo. The order was sent in by M. E. Hulse, western district manager for the Consolidated company.

ACCORDING to Clarence D. Chamberlin, New York City, Consulting Aeronautic Engineer, Floyd Bennett Field on Barren Island, opposite Rockaway Peninsula, is now ready for the operation of seaplanes and amphibians. The natural beach on the east side of the site affords a perfect landing for amphibians at both low and high tides. Work on the field itself has progressed to the point where engineers are ready to begin laying their top soil and, if funds are available, a runway 2,000 feet long and 100 feet wide will be constructed.

# KEYSTONE



## PATRICIAN 20 passenger transport

### A nation-wide tour by the Patrician

KEYSTONE'S 20-passenger Transcontinental Air Liner leaves Bristol, Pa., in early February on a Demonstration Tour which will include the principal cities of the United States. Aviation enthusiasts and operators will be given an opportunity to see—yes, and to fly—the *safest, swiftest, largest transport ever produced*. The following are actual performance figures:—

151 miles per hour ... 17,400 ft. ceiling ... 3880 lbs. payload  
—unmatched in the multi-engined field.

A production series of planes of the Patrician type is now well under way and the summer of 1929 will find them in daily service on several leading air lines.

## KEYSTONE AIRCRAFT CORPORATION

Sales Department  
31st St. and East River, New York



Plants  
Bristol, Pa., and New York City

Manufacturers of the KEYSTONE-LOENING AMPHIBIAN



## ALBANY AIR NEWS

By H. F. WOOD

**T**WO bills designed to aid New York state's aeronautic progress have been presented to the 1929 legislature by Senator J. Griswold Webb, chairman of the joint legislative committee for aviation. Other measures probably will be drafted at the meeting of the New York State Aviation Conference, to take place in New York City February 6.

The first of Senator Webb's bills is to permit two or more municipalities to combine in the establishment and the maintenance of an airport. This measure will increase the number of airports in the state, it is believed.

The second bill proposes to exempt cities with reasonably safe landing fields from liability for damages to planes "cracking up" in landing. Because of this present liability, Senator Webb explained, several municipal airports have failed to provide identification marks, for they are not anxious to attract fliers to the field.

**T**HE New York Power and Light Corporation this spring will complete the marking of Albany area gas reservoirs for the guidance of aviators. Holders in Schenectady and Gloversville already have been marked, and holders in Albany, Troy, Hudson, Glens Falls, Saratoga Springs and Oneida are to be given immediate attention.

The name of the city, in letters 10 feet high, is to be painted in white or orange on a dark background. In addition, there will be an arrow pointing the direction to the nearest airport and an indication of the distance.

**T**HOMAS W. WINK has been appointed second night superintendent at the Albany Airport. Patrick S. Prendergast is the other night superintendent, and Joseph F. Fitzgerald, Jr., is the day manager.

**J**OE JAMES has returned to his old position as chief pilot for Albany Air Service after flying mail for a month with Interstate Airways. Frank Ambrose, reserve pilot for Canadian Colonial Airways, also is flying for the same concern.

The company's ground school lists fifty students, and fifteen students are taking flying instruction.

**F**LYERS, INC., has begun its winter ground school with an enrollment of about fifty students. A. R. Mabry is in charge of the ground school, which will be based on the Rankin system. Courses are being taught by Ted Burke and Warren J. White, school pilots.

## BUFFALO AIR NEWS

By W. J. MAHONEY

**B**UFFALO has been designated as a starting place for one of the five cross-country airplane races for the Gardner Cup, to be held May 28-30 with East St. Louis as the destination in each event.

**I**T seems assured that Buffalo will soon be a permanent Army Air Reserve base. Major William Ryan, chief instructor of the Second Corps Area, recently inspected the Buffalo Airport to determine its facilities as an air reserve base. After an extensive survey, he heartily approved the Buffalo field and conferred with Mayor Schwab relative to plans for erecting two hangars for the use of the reserve air force.

**C**APTAIN H. W. FLICKINGER has been permanently assigned to Buffalo as Army test pilot. He succeeds Lieut. Erik Nelson, round-the-world army flier, who is now with the Boeing company, Seattle. Captain Flickinger is at present occupied with inspecting the new Curtiss pursuit planes. The Curtiss company has received a contract for eighteen pursuit ships modeled after the Curtiss Hawk and equipped with the new Conqueror engine.

**T**HE Airport Advisory Board has promised that Buffalo Airport will soon undergo the various additions and improvements which are necessary in order to make it one of the best equipped in the country. Three new hangars are to be erected, boundary lights, floodlights and beacons are to be installed and the runways are to be lengthened.

### Buffalo Aviation Show

**T**HE Buffalo Aviation Show, to be held March 23rd to 30th, has received the official sanction of the Aeronautical Chamber of Commerce. To date seventeen airplanes have been entered. These include: Consolidated Husky Junior, Curtiss Falcon-Knight, Curtiss Robin, General Airplanes Aristocrat, General Airplanes Surveyor, Waco, Ryan, Fairchild, American Eagle, Stearman, Stinson Detroiter, Travel Air, Command-Aire, Ford-Stout, Taylor Chummy, Cunningham-Hall and Keystone.

The show will be held in the 174th Regiment Armory, which has approximately 64,000 square feet of usable floor space, free from pillars, posts and other such obstructions.



Fokker amphibian in flight

tions. It is situated near the heart of the city, readily accessible from all hotels and stations.

The executive committee for the show is made up of the following aviation enthusiasts: Major John M. Satterfield, general chairman; Frank R. Collins, treasurer; Lieut. R. S. Biggs; Lieut. Nathaniel E. Duffy; Major R. H. Fleet; William T. Jebb, Jr.; C. Roy Keys; Theodore C. Knight, exc. chairman; E. D. O'Dea; Ansley W. Sawyer; Robert H. Tift; Kenneth A. Wood; and George B. Boden hoff, manager of the aviation show.

## CENTRAL NEW YORK

By MILDRED MARVIN

**M**AYOR HANNA of Syracuse directed recently that notice be served on the Alfred L. Hinsdale estate that the city intends to exercise its option on the leased Amboy-Syracuse air field, and will buy at the agreed price of \$50,000. The field is being rented for \$3,000 a year.

Plans have been drawn for the erection of an administration building on the airport early in the year. The building will house offices of field executives, a control room for light switches, and a pilots' room.

**I**T is planned to establish about 25 weather stations throughout the state, each at a cost of \$450, to be paid from a state fund.

**T**HE state is to be divided into districts. And an effort will be made to have names of all villages and cities plainly marked on the roofs of buildings.

**G**ORDON K. HOOD, manager of the Syracuse-Amboy airport, in his annual operating report, states that from January 1 to November 15, 1928, 628 transient airplanes visited the municipal airport; 20 locally owned airplanes operated at the airport; these latter ships were flown a total of 1,126 hours or 89,922 miles; a total of 2,734 passengers were carried; gasoline sales at the airport totaled 16,215 gallons; 175 gallons of oil were sold; 12 flying students were soloed during that period, and more than a dozen others are now taking instruction.

## NEW JERSEY AIR NEWS

**W**ITH appropriate ceremonies at the field on January 5th, construction work on the new Central Airport at Camden was begun. Previous to the ceremonies at the field, a luncheon in honor of the occasion was held at the Walt Whitman Hotel.

Black and Bigelow, airport engineers, planned the airport and are carrying on its development. The field will probably be completed by next June.

**M**R. W. E. PACKMAN, chief inspector of the Cirrus Aero Engines, Ltd., of England, recently arrived in the United States to supervise the production and testing of Cirrus Mark III engines which are to be built in this country.

(Continued on next page)





# The DOLLARS ARE IN THE AIR

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AVIATION offers marvelous opportunities to the forward-looking man. Today the "dollars are in the air."

Consolidated Air College, a division of the famous Beacon Airways of America, offers a course in flying unexcelled in the United States. The recognized Rankin System of Flying Instruction is used. Nothing left to chance—every detail is carefully worked out. All phases of Aviation are covered, including theory of flight, practical flying, motor overhauling, construction and installation, structures and rigging, navigation, meteorology, etc.

American Eagle, Cessna Monoplanes and Lincoln-Page Biplanes are used. Situated in beautiful Kansas City with its wonderful flying territory all around.

Fill out and mail the coupon for full information and illustrated catalog.

## CONSOLIDATED AIR COLLEGE

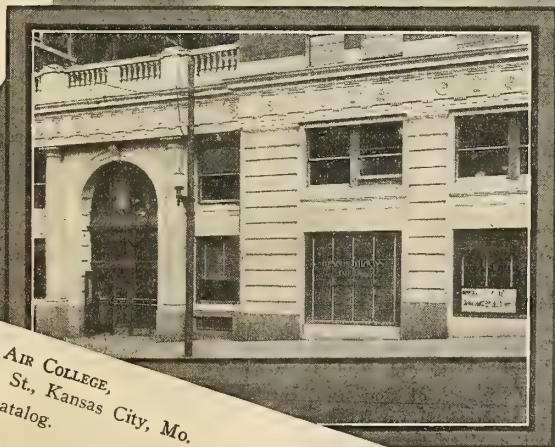
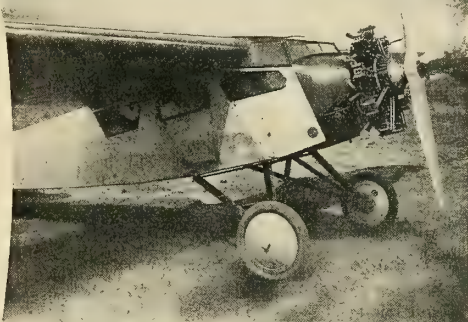
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(New Jersey Air News continued)

The American Cirrus plant will be located at Belleville. A. G. Lloyd is production manager of the company; Clarence A. de Giers and Prof. Alexander Klemm, consulting engineers; and Capt. W. Newton Lancaster of England, chief test pilot.

**THE Gates-Day Aircraft Corporation** of Paterson has changed its name to New Standard Aircraft Corporation. Because of ill health, Ivan R. Gates has resigned as president of the company. Charles L. Auger, Jr., and Felix J. Pittit have been added to the board of directors.

The company produces New Standard airplanes. The new factory building, which was expected to be ready for production the last of January, will triple the company's working floor space.

Major William C. Brooks will head the New Standard Flying Service, Inc., formerly known as Gates Flying Circus. The personnel of the flying service includes John Ashcraft, Ives McKinney, Homer Focker and Warren B. Smith.

**THE William H. Mallon Co., Inc.**, airport engineer of Asbury Park, is undertaking the planning and development of the new Lakehurst commercial airport. Two hangars, repair shops and an administration building are to be constructed on the 75-acre tract comprising the field. A fence bordering two sides of the tract will be erected, and a complete lighting system will be installed. This airport is to be the operating base of Great Eastern Airways.

**THE Sulzberger Aircraft Sales Corporation**, distributor for Eaglerock planes, has appointed as local dealers for Eaglerocks the F-H Motors, Inc., of Montclair, and Roehle Motor Sales Co. of Bloomfield.

**GREAT EASTERN AIRWAYS, INC.**, has been organized for the purpose of operating Lakehurst Airport and conducting an airplane taxi service. Murray and Smith, aerial photographers of Philadelphia, are merging interests with the new company.

Lakehurst Airport, which lies just north of the Naval Air Station and which now contains about 45 acres of land, will be enlarged by the addition of a 30-acre tract to the west. Development at the field will include the erection of a steel and concrete hangar, 60 by 80 feet, and the installation of complete servicing facilities.

The company was organized by Kenneth M. Murray, Byron Hancock and Clyde S. Adams.

## DELAWARE AIR NEWS

**JOSEPH V. MAGEE**, who for the past few years has been in charge of the aircraft Duco activities of E. I. du Pont de Nemours & Company of Wilmington, has been granted a leave of absence by that company in order to assist Col. Paul Henderson in the construction work now being carried on by Transcontinental Air Transport, Inc. As engineer, he will supervise the installation of hangars, radio and meteorological stations, airway lighting equipment, etc., on the new coast to coast airline of T.A.T.

## PENNSYLVANIA NEWS

### Pittsburgh Aircraft Show

**VIRTUALLY** every phase of aviation in the tri-state region is represented in the group of men selected to comprise the show committee of the First Annual Pittsburgh Aircraft Show, to be held March 9 to 16, in Motor Square Garden, Baum Boulevard and Beatty Street, under auspices of the Aero Club of Pittsburgh.

The committee, selected from outstanding aeronautical leaders in Pittsburgh and vicinity, is as follows: Chairman, Raymond A. Tucker, executive vice president and sales manager, Aircraft and Airways of America, Inc., and vice chairman, Aeronautics Committee, Pittsburgh Chamber of Commerce; Robert A. Laedlein, president, Aero Club of Pittsburgh; John P. Morris, president, Morris Flying Service and first vice president, Aero Club, and secretary, City-County Air Board; Col. William Thaw II, third vice president, Aero Club; Halsey N. Bazley, secretary, Aero Club; Edward W. Thomson, treasurer, Aero Club; Raymond M. Marlier, chairman, Aeronautics Committee, Pittsburgh Chamber of Commerce; Capt. Thomas S. Voss, commanding officer, Rodgers Field, 324th Observation Squadron; Col. Harry C. Fry, Jr., Frank Dickson and John A. Fife, members, board of governors, Aero Club; Harry C. Neel, president, Pittsburgh-McKeesport Airport Company; F. Lemoyne Page, president, Aircraft & Airways of America, Inc.; William M. Gardner, president, Gardner Aviation Service, Inc.; Norman Allderice, vice president, Pittsburgh Aviation Industries, Inc.; Harry A. Kraeling, president, Standard Steel Propeller Company; C. P. Mayer, president, Mayer Aircraft Corporation; C. C. Gage, Micarta Propeller Division, Westinghouse Electric & Manufacturing Company; D. Barr Peat, vice president, Clifford Ball, Inc.; T. N. Toupet, president, Pittsburgh Aviation Co., Inc.; Major J. Sydney Owens, commander, 28th Division Air Service, Pennsylvania National Guard, and Hollinshead N. Taylor, president, Aero Club of Pennsylvania, and chairman, Aviation Committee, Philadelphia Chamber of Commerce.

Headquarters for the aircraft show have been established in the lobby of the William Penn Hotel, with Ray Krimm, show director, in charge.

**THE Synthane Corporation** is completing the building of its plant at Oaks, near Philadelphia, and probably will begin production of laminated Bakelite products in the early spring.

R. R. Titus is president of the corporation; J. B. Rittenhouse, vice president; and George J. Lincoln, secretary-treasurer.

**I**N recognition of his work in the design and development of radial air-cooled engines, the British Society of Engineers has awarded the Bessemer Premium to Capt. Robert W. A. Brewer of Huntingdon Valley. This is the third occasion upon which Capt. Brewer has been awarded the Bessemer Premium for outstanding engineering work.

### Airport Proposals in Philadelphia

**C**ONSIDERABLE interest has recently been aroused in Philadelphia over the selection of an airport site adequate to meet the future needs of that city. One of the principal locations suggested is a 400-acre tract near Springfield in Delaware County, which was chosen by the engineering firm of Ford, Bacon & Davis as the best available site for the main Philadelphia air terminal. Ford, Bacon & Davis, acting on behalf of the chamber of commerce and the Regional Planning Federation, made an extensive survey of the entire district. The site they preferred, although not in the city limits, is but thirty-two minutes by automobile from the city hall. Runways 3,000 feet in all directions and 3,600 feet in the direction of the prevailing winds could be laid out on this site. Since this land is 250 feet high, it is comparatively free from fog and smoke which hang over the lower districts. If the height of future buildings is properly restricted and if telephone lines are removed, this proposed airport would be free from all obstructions, for the land slopes away on all sides.

The estimated cost of developing the site is \$707,000, and its purchase price is estimated at about \$1,000,000.

Another location suggested is in South Philadelphia, about a mile from the Delaware River, where there are large areas of wet land which in the future may be drained and filled. This site is somewhat closer to the center of the city than the other, but it has an abnormal amount of smoke and fog.

### Philadelphia Airport Facilities

Flying fields in operation in the Philadelphia district at present include the following:

1. The Philadelphia Airport, located on Island Road near the southern city limits.
2. Pitcairn Field, on the Doylestown pike, near Horsham.
3. Bryn Athyn Field, located at the factory of Pitcairn Aircraft, Inc.
4. Patco Field, on the Ridge pike, near Norristown, used by Philadelphia Air Transport Co.
5. Keystone Field, near Bristol, at the factory of Keystone Aircraft Corporation.
6. Central Airport, in Camden, N. J., being developed by Central Airport, Inc., and now used by Crescent Air Service, Inc.
7. William Penn Airport, on Roosevelt Boulevard, used by Interstate Flying Service, Inc.
8. Lincoln Airport, on Roosevelt Boulevard, used by Lincoln Air Service, Inc.

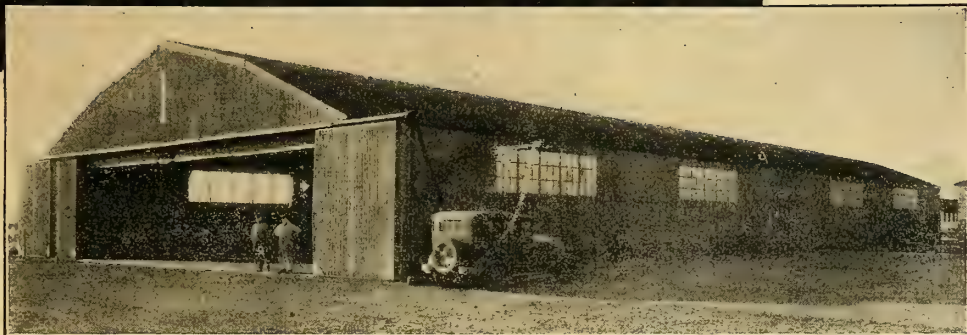
The survey of Ford, Bacon & Davis took into consideration all these and other possible locations. The Aero Service Corporation of Philadelphia made all the maps for the survey.

**S**EVERAL new products have recently been added to the line of the Bonney Forge and Tool Works of Allentown. They are a new rim nut wrench with automatically adjustable steel jaws, a new metal case for the No. R chrome vanadium socket wrench set, and a new wrench for Chevrolet main bearings.



**I**n... army fields  
 ... navy fields  
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"A Typical Govern-  
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# ROBERTSON

*Has the Experience*

**L**ET us take the record of RPM with just the United States Government alone . . . and see what it reveals.

The Government has been at this business of developing aviation and airports longer and more continuously than almost anyone else. It keeps an eagle eye on materials and the record of their performance. It has infinitely greater facilities for research into materials than any single individual or corporation. In fact, it has been said that the United States Government is probably the most skillful and wide-awake purchaser of materials in the world; that it knows more than anyone else about the things it buys, and that it gets more for its money than anyone else (See

the much talked about book "Your Money's Worth" for details).

What has this canny buyer done about covering materials (roofing and siding) for its hangars? Figures tell the story better than anything else. The Government has bought more than 7,000,000 square feet of Robertson Protected Metal roofing and siding the last seven years. It has been using RPM and watching its performance since the days in 1917 and 1918 when it was using this corrosion-proof material on hangars in France.

Would you like to know more about the material that has made such an enviable record with the Government? Write to H. H. Robertson Company, First National Bank Building, Pittsburgh, Pennsylvania.

**H. H. ROBERTSON COMPANY · PITTSBURGH**



## ST. LOUIS AIR NEWS

By A. W. LEAGUE

**I**NITIAL plans for the proposed \$2,000,000 municipal airport have been submitted to the Airport Committee by a technical committee, headed by Major A. B. Lambert, which is working in conjunction with it. The plans submitted provide for two runways of concrete or similar material, a concrete apron, 150 feet wide, skirting two sides of the field, and a building and development program. The runways are to be arranged so as not to interfere with the present area now in grass. One of the runways will lay approximately east and west, and the other will be approximately north and south. The latter, 4,500 feet in length, will connect the hotel and administration building with the industrial district lying near the Wabash Railroad tracks on the north side of the field. The other runway will be 4,000 feet in length. Both runways will be 200 feet wide and will cost approximately \$500,000.

The building program includes erection of a headquarters building for the air service, a double hangar, 120 feet deep and 180 feet wide, with two spans of 100 feet and 80 feet, which would cost about \$100,000. A \$75,000 hangar, which the city will lease for commercial purposes, will also be erected. Besides the elaborate lighting system, a sub-surface drainage system, small fire apparatus, rolling stock requisite to keep the field in shape and a \$90,000 appropriation for hard roads to connect up the buildings of the airport are also recommended by the committee. A general clean-up has taken place. A number of sheds and old frame structures have already been torn down to make way for the new improvements.

**T**HE Mahoney-Ryan Aircraft Corp. has consigned five Ryan Broughams to L. E. Gale Company of Hankow, China. The planes were shipped from San Francisco by steamer in charge of Earl Baskey, veteran St. Louis air mail pilot, who will supervise the assembling and testing of the planes at Hankow. The Gale company is the Packard automobile distributor in China and will also handle Ryan planes. The five planes were purchased for the Wu-Han Civil Aviation Company and will be used in passenger service. The company also reports the sale of a Ryan Brougham to the Irving Air Chute Company of Great Britain. Production is gradually being stepped up at the Mahoney plant to take care of the orders for the new six-place brougham.

**B**IDS for the passenger station to be erected at the Transcontinental Air Transport airport, near East St. Louis, are being received, and construction of the station and hangars will be started immediately. The passenger station will be two stories high, with a basement and will be of stucco and brick, with a tile roof. It will be 85 feet long and 30 feet wide, and will have a brick paved terrace at one end. The first floor will contain a dining room, lunch room, kitchen, waiting room, ticket office and lavatory. The second floor will have two double

bedrooms for pilots and a living room opening on to an open porch. The station, the erection of which will cost about \$25,000, was designed by Love-Sultan, Inc., of St. Louis, air consultants for Transcontinental Air Transport, Inc.

**T**HE Naval Reserve Flying Club has been completely reorganized and shows promise of becoming one of the largest flying clubs in this section of the country. The new club is known as the St. Louis Association and is being incorporated under the laws of the State of Missouri as a non-profit making organization. The purpose of the club is to provide a means by which the average man can learn to fly at a minimum cost and without interfering with his business. The officers of the club are: J. T. Herzog, president; Clarence Brown, secretary; T. J. Lorenz, treasurer; and Milford Sater, chief pilot.

**A** SITE on Natural Bridge Road east of Lambert Field has been selected for a Government radio and weather report station to be erected by the Aeronautics Branch of the Department of Commerce. The station will have a 125-foot radio tower and will be connected to Lambert Field by telephone and ticker. Hourly reports on the weather in all parts of the country will be issued. The station will be in operation about the last of February.

**V**ON HOFFMANN AIRCRAFT CORP. has requested permission from the City Airport Commission for right of way to Lambert Field from a 4½-acre tract adjoining the airport on the south. The company plans to erect a new hangar, a school building and student barracks on this site. Included in the building and expansion program is the construction of the company's own training plane. It was designed by the school instructors and is being constructed in the Von Hoffmann workshop.

**A**IR mail service between St. Louis and Chicago has been extended from six to seven days a week. The Sunday schedule will be the same as week days, with the northbound plane leaving Lambert Field at 4:15 p. m.

**B**IDS for the first section of a 75-room hotel to be erected at Parks Airport are being let, and work on the section to contain 25 rooms will be started immediately. A limited number of rooms will be reserved for flying students who may prefer the hotel to the dormitory accommodations now offered at the Parks Air College.

**T**HE Gardner Cup Race, which will be held at Parks Airport on May 28th, 29th and 30th, for \$10,000 in prizes and a cup donated by Russell Gardner, president of the Gardner Motor Company, has been approved by the National Aeronautic Association. The first leg of the race will be from Buffalo, Denver, San Antonio, Jacksonville, Fla., and Bismarck, N. D., to Parks Airport. Prizes totalling \$5,000 will be distributed to the winners of these five

events. The winners will then race from Parks Airport to Indianapolis and return for a capital prize of \$5,000. The winner will retain possession of the cup for one year. The race is open to planes of any design, motors being limited to 800 cubic inches displacement.

**A**MOS O. PAYNE, head of the Parks engineering staff, is now chief engineer and production manager for the organization, following the resignation of Richard F. Hardin. W. M. Thompson, for nine years a civilian employee of the Army Air Corps, has been made head of the mechanic school of Parks Air College, and Homer Clark, formerly with the Travel Air factory force, has been appointed assistant production manager.

**T**HE Parks Air College started the year out with forty-seven students registering during the first nine days of January, bringing the total enrollment up to 478. Under the new schedule just placed in effect in the school, flying students receive 20 hours of instruction instead of 10 hours, in order to qualify them for a license as private pilots. Twenty-seven qualified pilots have enrolled in the post graduate flying course, with specialized training in night and blind flying, which will open March 1st. This course includes 468 hours ground school work and 50 hours flying. The flying time will be divided into four divisions—night and cloud flying, 17 hours; radio flying, 2 hours; cross-country flying by instruments exclusively, 21 hours; photographic flying, 10 hours.

**T**HE Curtiss-Robertson Airplane Manufacturing Co. is now turning out thirteen planes a week, and plans are being made to enlarge the plant so as to step up production in order to take care of the constant stream of orders. An order for ten Challenger Robins was received from E. H. Garland of the Garland-Clevenger School of Aeronautics of Tulsa, Oklahoma. Garland and Clevenger now have six OX-5 Robin planes in use at their flying school. The new planes are to be used on a projected airline between Mexico City and Tulsa.

**S**T. LOUIS is to have another air passenger line, according to an announcement from Pittsburgh of a projected route from that city to St. Louis, with stops at Wheeling, Columbus, Dayton, Indianapolis and Terre Haute. The American Aircraft Corp. of Pittsburgh, organized last September, is to operate the route. Edward Ball, vice president of the concern, said the operating company would be known as the Pittsburgh and Western Air Transportation Company. Operation is expected to start some time during the month of February. Daily schedules will be maintained and passengers and express will be carried.

**T**HE world's record for barrel-rolling in an airplane was broken at Lambert Field by "Red" Jackson, test pilot for the Curtiss-Robertson Airplane Manufacturing

(Continued on next page)

FROM NOW ON—

# Aviation Mechanics' Training *must meet a new standard!*

*Every graduate of Parks Air College  
Airplane and Engine Mechanics'  
School is fully qualified by training  
for Department of Commerce licences  
as Airplane and Engine Mechanic!*



Here is a great forward step in aviation mechanics' training. No longer need you accept less than a complete course of training, less than a course of study that actually fits you for a responsible, well-paid job.

Parks Air College sets this new standard in maintaining its leadership as the largest and most completely equipped air school in the United States. It is in keeping with the front-rank position to which this school has advanced. When you graduate from Parks every airline operator, airplane factory executive, and airport manager will know that you are thoroughly trained—not a half-taught amateur. And there are plenty of jobs waiting for you—NOW!

Our mechanical course gives you every class of work necessary to qualify for a Federal Airplane and Engine Mechanic's license and in addition gives you the academic background that you will need as a factory superintendent or airline executive.

Parks equipment includes everything in modern power plants—Whirlwind, Liberty, Caminez, Velie, Hispano-Suiza, OX-5, and other famous engines. You tear them down, rebuild them, test them under the eyes

of experienced instructors. You learn every operation of complete shop practice, including welding, brazing, metal working, and wood work.

You learn all about airplanes. You actually build them. You learn factory production methods, qualify yourself for field duty, factory positions or places as foreman or superintendent.

The moment you get to Parks you'll realize why other men have come from every part of the United States.

The bustling activity, the enthusiasm and spirit that pervade the institution, fire you with a new thrill. You are at a school where you can prepare for a definite future.

Come to Parks Air College! Your opportunity today is twice as great as it will be a year from now. Let 1929 mark the turning point



15 minutes from the downtown hotel and theatre district of St. Louis.

in your life—let it be the date of your entrance into the fastest-growing profession in the world. Don't hesitate—come at once, or send for our illustrated book "The Man Who Tunes the Plane." It describes and pictures Parks Air College thoroughly. Use the coupon now!



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LARGEST CIVILIAN AVIATION SCHOOL IN THE WORLD.

Parks Air College, Inc.,  
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St. Louis, Mo.

Send me "The Man Who Tunes the Plane," with complete information about your Aviation Mechanics' Course.

Name .....

Address .....



(St. Louis Air News continued)

Co., who made a total of 417 consecutive barrel rolls in an OX-5 Robin. The previous record, set by Ed Hedein in a Waco biplane, was 283. The record made by Jackson was officially recorded by three members of the National Aeronautic Association. Three hours and three minutes flying time were required.

THE draft of a proposed air traffic code for Missouri is being prepared by the legislative committee of the St. Louis Chamber of Commerce Air Board and probably will be presented at the coming session of the state legislature. The proposed code will be similar to the Federal code and to air traffic rules in effect in other states.

RADIO STATION WIL. Hotel Melbourne, St. Louis, has inaugurated a special wind direction and velocity broadcast, for the convenience of pilots, in conjunction with its regular weather report. Daily at 10:00 a. m. and 4:00 p. m. WIL will broadcast a wind aloft report, using information received by telephone from the local United States Weather Bureau. A rotating beacon is being installed at the WIL Airport near St. Louis. Floodlights and boundary lights will be added later.

THE Robertson Aircraft Corp. has opened a spare parts and aeronautical supply store at the Chicago Municipal Field.

THE Robertson Aircraft Corp. has been appointed servicing and repair agent for Wright engines and products in this territory. A complete line of Whirlwind spare parts will be placed in stock. Fred Brown, former crew chief on the mail and passenger planes of the Robertson company, will have charge of the new Wright overhaul department.

THE CARDINAL, a two-place cabin monoplane made by the St. Louis Aircraft Corporation, a subsidiary of the St. Louis Car Company, has successfully passed tests at Scott and Lambert Fields. The St. Louis Aircraft Corporation, which is the fifth airplane manufacturing company to begin operations in St. Louis, plans to place the ship in quantity production after a few minor changes are made. The Cardinal has a wing spread of 32 feet and is 22 feet in length. The plane is of welded steel tubular construction and weighs 750 pounds loaded with 25 gallons of gas. It is powered with a 75 horsepower LeBlond air-cooled motor and cruises at 85 miles per hour. J. A. McMillan is test pilot for the concern.

THE new air mail hangar and combination school and passenger depot building being erected by the Robertson Aircraft Corporation on the west side of Lambert Field is practically completed.

A NEW light plane will be manufactured in St. Louis by April, according to officials of the Guardian Aircraft Corporation. The ship will be a low-wing mono-



D. H. Hollowell, sales manager for the American Eagle Aircraft Corp.

plane with accommodations for pilot and passenger in a single seat, side by side. The wings will be of high lift, cantilever construction. Its top speed is estimated at 90 to 95 miles per hour, and its landing speed at 35 miles per hour. It will have a wing span of 30 feet and will be powered by a forty to sixty horsepower motor. The fuselage will be of welded steel tubing. The concern also supplies materials and plans for amateur sport plane builders.

THE new control station and field manager's office at Lambert Field has been completed, and Field Manager Scott has moved into his new office. In addition to the field manager's office, the building contains lavatories and a large lounging room for pilots. There is an observatory on top from which a view in all directions can be obtained. An oil burning heating plant and generators for the field lights are housed in the basement. This structure, which is of stucco, is the first building to be erected under the \$2,000,000 airport bond issue.

DEREK WHITE, who has been general manager of Parks Air College for the past year, recently purchased a controlling interest in the Guardian Aircraft Company of St. Louis. Previous to his connection with Parks, he was general manager of the Marshall Flying School of Marshall, Mo.

## KANSAS CITY AIR NEWS

By H. H. JAMES

THE United Aircraft Corporation of Kansas City and the Commercial Aircraft Corporation of Los Angeles recently consolidated.

In the consolidation C. C. Baldwin, president of the United, retires but remains as a director. J. T. Jennings, a lawyer, and Hugh L. Thompson, airplane designer and technical engineer, both of Kansas City, become members of the board of directors. Mr. Thompson also becomes chief of the designing engineers of the United staff and

consulting engineer of the Commercial company. The planes for the United will be made here, while the planes of the Commercial will be made in Los Angeles. Both lines of planes will be handled by the organizations in each city.

Officers of the Commercial organization include William M. Griffith, president; Charles R. Francis, vice president; John R. Clow, secretary; Roy S. Younglove, treasurer; Arthur B. Green, general manager. Directors: Frank P. Comstock, Ridgley Rea and J. Ernest Wheatcroft.

The organization has placed a contract with the Butler Manufacturing Company of Kansas City for the building of fifty six-seater biplanes in lieu of a United factory.

One plane, designed by the technical staff of the United company and built at the Standard Steel Works in North Kansas City, has been shipped to Los Angeles for test flights.

A SECOND landing field, located just north of the present landing field, has been started at the Kansas City municipal airport.

THE largest electroplating vat in the United States, for the electroplating of the entire fuselage of a metal plane at one operation, has been installed by the Bar-Rusto Corporation. The electroplating process makes the plane fuselage rust-proof and eliminates the need for galvanizing. The tank is 30½ feet long.

**American Eagle Sales Force Growing**  
TWENTY-FIVE new contact dealers have been added to the roster of the American Eagle Aircraft Corporation's sales force. The Kansas City aircraft manufacturer now has a sales force of more than 1,000. New contact dealers recently added to the rolls include: H. F. Gaylord, South Bend, Ind.; Lyle Tidwell, South Bend, Ind.; Creasy Arms Company, Beach City, O.; Charles V. Geron, Mechanicsburg, O.; H. S. Prescott, East Liverpool, O.; Carl H. Henrichson, Atchison, Kas.; Simon-Weber Motor Company, Oskaloosa, Kas.; W. G. Dunn, Bluefield, W. Va.; Alva Ketner, Marion, Ind.; W. J. Rolles, Ft. Wayne, Ind.; Noble Wade, Columbus, Ind.; Robert Blankenship, Newburg, Ind.; C. B. Swope, Vincennes, Ind.; Cummings Motor Co., Paola, Kas.; E. G. Moore, Tampa, Fla.; J. F. Buchman, Charlotte, N. C.; A. N. Emberton, Prospect, O.; Floyd Liles, Connersville, Ind.; W. E. Schulenberg, Jr., Independence, Mo.; Leo Brennan, Davenport, Ia.; Charles Schromerous, Hillsdale, Ill.; J. M. Jones, Newark, O.

MISS RUTH HAVILAND, Kansas City's first woman pilot, has been engaged by the owners of Fairfax Airport, a subsidiary company of the Woods Brothers Corporation, as hostess for the field. She has been supplied with a reception room, telephone and telegraph service and a Packard sedan for the convenience of air  
(Continued on next page)



# Derek White now on his own!

Known to pilots, executives, and aviation graduates throughout the United States—formerly general manager of the Marshall Flying School and of the Parks Air College, formerly general sales manager of the Nicholas-Beazley Airplane Co.—Derek White is now on his own!

With associates prominent in aviation and in business he announces the opening of the Guardian Aircraft Company and the Guardian Air College.

After 15 years' practical experience in the aviation industry Derek White will now produce and market a light plane—an airplane for everybody, to be in production in April—and in conjunction now operates his own ideal school of aviation.

More men have learned aviation under the supervision of Derek White than under any other individual in America! It has been said that Mr. White's ability in sales promotion of airplanes and aviation products is unequalled by any one in the United States! He now offers an opportunity to every ambitious man who wants to get into aviation and who wants to make money once he has secured his training.

## Wanted: 500 Ambitious Men Who Want To Succeed in Aviation!

Here is the most astounding offer ever made to aviation students. The vital problem confronting graduates of aviation schools heretofore has been to get started after training. Derek White has solved this problem. It is not necessary to have large capital. It is not necessary to even have the price of an airplane when you have completed your training! If you are really serious about your future in aviation then join the Guardian Air College now. The first 500 graduates will be offered the privilege of being the Guardian dealer in their district without the necessity of buying a ship!

### Complete Training in Commercial Aviation

At the Guardian College you are not only taught actual airplane construction and repair, the overhaul, operation and maintenance of aeronautic engines, aerodynamics, theory of flight, and other subjects covered by other reputable aviation schools, but in addition will be taught factory production methods, airplane business and sales methods and the subjects found over a period of years to be necessary if success is to be attained.

THE GUARDIAN AIR COLLEGE WILL NOT TEACH FLYING, because there will always be a tremendously greater demand for ground men—airplane and engine mechanics, foremen, superintendents, airport managers, production experts, sales experts and airway engineers—than for pilots!

Only one course is offered which covers six months, and includes the subjects you need to succeed.

### SPECIAL PRICE IF YOU ACT AT ONCE!

The price of this great course in Commercial Aviation, the finest training ever laid out or taught by Derek White in any school, is \$300, which covers six months of thorough training.

The first 50 students arriving at school in February may work out \$200 of this outside of school hours, requiring only \$100 cash for tuition!

If you want to succeed in aviation, if you want the finest training money can buy, if you want to be one of the lucky 50 to get the full six months' course for \$100—take the next train for St. Louis. If you want to start in aviation under the personal supervision of the Dean of all aviation school executives—take advantage of this offer! If you are one who instantly recognizes the most amazing offer ever made—leave immediately for the Guardian Air College at St. Louis. If you want further information send the coupon for a copy of Derek White's new booklet "Saw the Heavens Filled with Commerce."

BUT ACT AT ONCE!



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Guardian Air College

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ST. LOUIS, MISSOURI

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# GUARDIAN



(Kansas City Air News continued)

travelers landing at the port. One of the company's planes is also at her disposal.

Miss Haviland completed her flying instruction last November and a month later received her license from the Department of Commerce. Her preliminary work was taken under W. F. Spencer, now director of Fairfax field, and the remainder under Dale Seitz, also a Fairfax pilot. She has over 100 hours and is working under Seitz for her transport license.

**T**HE rapid influx of recent airplane orders reported by the American Eagle Aircraft Corporation is attributed chiefly by E. E. Porterfield, Jr., president of the company, to interest in aviation created by the record smashing flight of the Army's endurance plane, the *Question Mark*.

"In the last week we have received an average of five airplane sales orders a day," said Mr. Porterfield.

"Throughout the East we find interest in aviation increasing in virtually the same proportion as it is in the West. Also, we have received a number of inquiries relative to our sales franchises from territory in which we never before have been able to create the required amount of interest.

"Aviation needs this type of assistance. It is extremely healthful and helpful to the industry."

**R**APID growth of the Porterfield Flying

School, Inc., of Kansas City, has necessitated removal of its offices, class rooms and display quarters to a larger building. A three-year lease has just been signed by the school for use of a building in the downtown business district. The new home of the school is at Fifteenth Street and Grand Avenue.

Capt. L. A. Miller, manager of the school, reports the addition of nineteen new students since the first of the year, the total enrollment now being 107. Flying activities of the school are at Fairfax Airport, where a building, which will be one of the units of the American Eagle Aircraft Corporation's new factory, is being erected for the ground courses.

**T**HE Butler Manufacturing Company held a banquet January 11 at the Kansas City Club to mark the close of the company's eighteenth annual sales school. About 200 salesmen and officials of the company attended.

At the annual board meeting all the officers were re-elected. They are: E. E. Norquist, president; Wm. A. Knapp, vice president; Roy S. Kemp, vice president; F. A. Ruff, secretary; and Oscar D. Nelson, treasurer.

**T**HE largest airplane hangar in greater Kansas City was erected by the Butler Manufacturing Company, Kansas City and Minneapolis. This hangar, made entirely of steel, is on the Fairfax Airport, Kansas City, Kansas, and was put up for the Woods Brothers Corporation.

The structure, which is 150 feet long by 80 feet wide, incloses space enough to house forty commercial type airplanes. Two

"lean-to" additions are on the east and west sides of the hangar. One of the four has been equipped for a restaurant, which is now in operation. The other three are to be used as offices.

**D**R. GEORGE L. BENNETT, director of the Bennett Flying Schools, has offered a reward of \$100 for information leading to the arrest of an impostor who, under the name of "Capt. James C. Hall," said he represented the Bennett schools and thereby victimized 15 or 20 prospective students in South Carolina and Georgia.

**U**SING a new pick-up device invented by Blaine M. Tuxhorn, a Kansas City pilot, Tuxhorn and L. H. Rhiner of the Nicholas-Beazley Airplane Co., Marshall, flew continuously for 10 hours and 54 minutes on January 2nd. They flew a Barling NB-3 metal monoplane powered with a LeBlond 60 engine. During the flight, fuel and supplies were successfully picked up from the ground thirteen times.

This was one of the longest continuous flights ever made in a light plane.

## OHIO AIR NEWS

BY T. E. LUNSFORD

**A** MEASURE to protect the public from unfit pilots and planes has been placed before the 88th general state assembly by the joint legislative committee on aviation appointed by the last legislature to study the development of aviation in Ohio.

Under the measure, a state department of aeronautics would be established to license pilots and aircraft. The committee also proposes that consideration be given to the regulation of aviation schools. Pilots holding Federal licenses would be exempt.

The committee further asks that a course in aeronautical engineering be established at Ohio State University. Cooperation of county and state officials with municipalities in the utilization of property outside cities for landing fields is also urged. Representative David C. Ingalls, Cleveland, is chairman of the committee.

**A** MUNICIPALITY has no legal right to lease land outside of municipal boundaries for airport purposes, but it can purchase or condemn such property, according to a ruling by Attorney General Edward C. Turner in an opinion to the State Bureau of Accounting. The city of Bucyrus, which sought to lease land for an airplane field, asked the opinion.

**W**ITH 65 cities and villages in Ohio marked for easy identification from the air, the campaign of the commercial aviation committee of the Ohio Chamber of Commerce to make the state 100 per cent marked is to continue in full force.

**M**EMBERS of the largest flying squadron class of the Goodyear Tire & Rubber Co. were presented with their diplomas at the annual banquet held recently. The class consisted of production squadron graduates and thirteen engineering squadron graduates.

**E**STIMATES of the number and kinds of lights necessary for the new Columbus municipal airport have been made, recommendations for which have been turned over to city engineers by aviation experts.

For the boundaries, it is estimated that 90 white lights will be needed, while 30 red obstruction lights should be placed on various buildings on the field and in the immediate vicinity.

The field will be illuminated by six 3000-watt floodlights, while a 3,000,000 candle-power rotating beacon, visible for many miles, will guide night flying pilots to Port Columbus. Supplementing the large beacon will be a small one, which will flash the words "Port Columbus" in code. In addition, provisions are to be made for the usual hangar floodlights, and other necessary lights in the many buildings to surround the field.

All wires on the field, and for a short distance away from it, will be underground, in order that a minimum of high obstructions will be in the way of ships coming in for landings. It will be several months before the airport is completed.

**E**XPRESS service by air has been assured for Springfield. Contracts have been signed for express service over the Continental Airlines, Inc., now part of the Universal Air Lines System, by the American Railway Express Co. The service is to start in about a month.

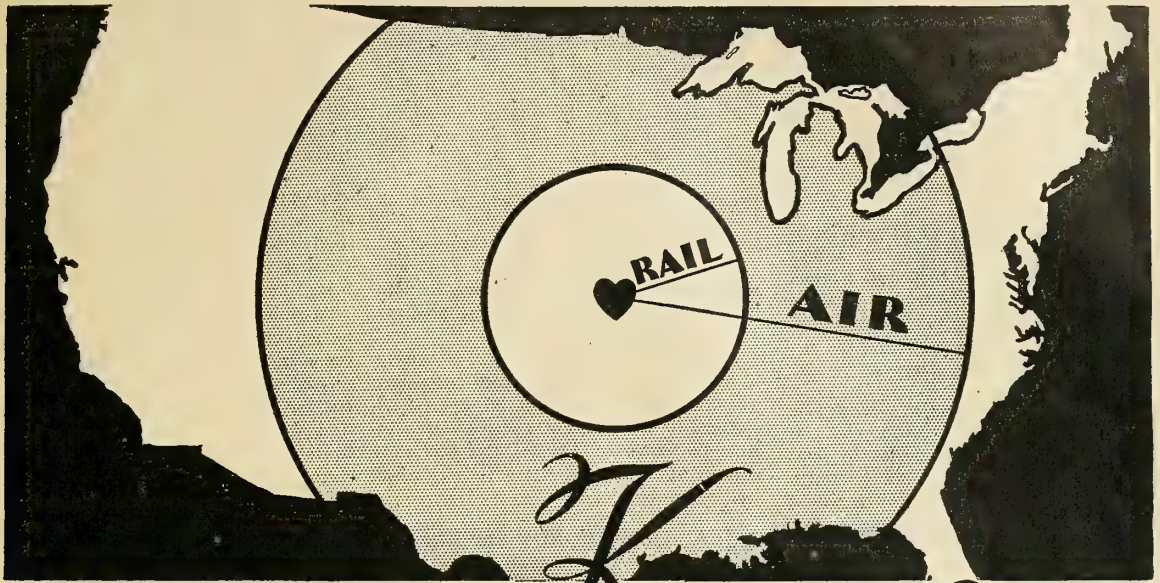
**A**PPPLICATION for incorporation has been filed at Columbus by the Akron Airlines, Inc. The incorporators plan to operate a fleet of planes from Fulton Field. In addition to carrying passengers on both business and pleasure flights, the company will act as agent for the sale of planes. Incorporators are Harold Earle, John Marhesky and R. M. Eagon.

**A**TTORNEY C. M. SEARL has resigned as president and director of the Vulcan Corporation, airplane and steel products manufacturers, of Portsmouth, and C. E. Dowling, who is also secretary-treasurer of the organization, has been chosen to fill the newly created position of general manager. The position of president will not be filled at the present time. John W. Snyder has been elected vice president. There will be no change in the policy of the company.

**T**HE *Puritan*, Goodyear pony blimp, will not go to Florida this winter as was planned. The *Puritan* is now being used as a training ship for lighter-than-air pilots at Wingfoot Lake. It has been thought best to keep it there so that this training may be continued without interruption. Goodyear now is building two more ships of the same type as the "Puritan."

**J**OHNSON and Orville Dulton, dairy farmers of Hardin County, have offered to donate to the city of Kenton a flying field and to build a hangar thereon if the city will enact legislation providing upkeep costs and a small rental.

(Continued on next page)



# KANSAS CITY— The Hub of Air Transport

At the center of the air transport system of America—today is an air age—areas reached by previously known forms of transportation become dwarfed by the speed of air travel—nine hours by air from Kansas City reaches  $2\frac{1}{2}$  million square miles

as compared to less than 300,000 square miles by rail, an increase of more than 900%—a rich market where the airplane finds its greatest utility in operating over the vast plains of the Middle West—Kansas City—the hub of air transport.



Chamber of Commerce of

## Not just a city but an empire

Kansas City advertising does not confine itself to corporate limits. Within the territory are raw materials and manufacturing advantages of a highly diversified nature . . . many within the city itself, many in the smaller cities of this rich area. Kansas City undertakes to tell the story of the entire territory to interested manufacturers, realizing that the city prospers only as its outlying territory prospers.

## Opportunity Here Awaits These Products

Men's and Women's Clothing \*\*\* Aircraft and Accessories \*\*\* Hosiery \*\*\* Dairy Machinery \*\*\* Steam Fitting and Heating Apparatus \*\*\* Furniture \*\*\* Porcelain Ware \*\*\* Perfumery and Cosmetics \*\*\* Millinery \*\*\* Wallboard \*\*\* Insulated Wire and Cable \*\*\* Moulding of Bakelite \*\*\* Radio Equipment

# KANSAS CITY

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(Ohio Air News continued)

**T**O. McMAHON, who has been head of the technical data section at Wright Field since the establishment of army aviation in Dayton, has resigned to become assistant to D. W. Douglas, president of the Douglas Aircraft Co., at Santa Monica, Calif. He will be succeeded at Wright Field by Capt. Shoras A. Blair, who has been stationed at the Dayton field.

**T**HE proposed purchase of 60 acres to be added to the Youngstown city airport was approved by the city council at a recent meeting of that body. The land to be added to the airport is owned by the Watson estate. It is planned to extend and improve the airport by lengthening the runways.

**A**N airplane terminal station, operated on the same plan as the railroad union station, has been placed in service by four of the commercial airlines operating through Cleveland. A downtown ticket office, with a waiting room and information bureau, has been established which will be connected with the municipal airport by motor bus. Stout Air Lines, Inc., National Air Transport, Inc., Dungan Aircraft Co. and the U. S. Airlines Co. are the sponsors of the new service.

#### Cincinnati's New Municipal Airport

**B**Y the middle of March, the first building on Cincinnati's new municipal airport will be ready for occupancy. This building will be a combination hangar and shop, to be erected just north of the present office building of the Embry-Riddle Company, on the western edge of the airport. It will measure 140 by 110 feet, and include a hangar space about 100 feet square. The hangar door will open to a distance of 100 feet, with a maximum height of 18 feet.

The shops will include a doping room, sufficiently long to accommodate a 100-foot wing; motor rooms, offices, and a large storage space in the mezzanine.

The Embry-Riddle Company has leased the first twelve hangars to be erected by the city, as added facilities in its operation of airlines, flying school and aerial photography.

**T**HE trimotored Ford transport of the Queen City Air Lines, which operates from the Watson Airport at Cincinnati in the summer months, is spending the winter in the south. Lieut. Ted Howe, formerly a pilot of the Ford Motor Company, is pilot of the plane and is carrying passengers on pleasure trips in southern Texas. John Doan, formerly with the Wright Aeronautical Corporation, is mechanic.

**C**ONSTRUCTION has started on the new hangar of the Universal Air Lines System at Brookpark Airport, Cleveland. The first building is to be 140 feet by 110 feet. On the first floor a room 40 by 30 feet will be equipped with easy chairs, a huge fireplace and plate glass windows overlooking the field. On the second floor at each end of the building there will be observation porches.

Showers, bedrooms, recreation rooms,

schoolrooms and the general offices for the pilots will occupy the second floor. The ticket offices and a general waiting room will be on the first floor. A heating and ventilating system, capable of moving 24,000 cubic feet of air a minute, will be installed.

The contract for the construction of the hangar has been let to the Matheny Construction Co.

**P**LANNING to begin actual production by February, the Alliance Aircraft Corporation of Alliance has scheduled the manufacture during 1929 of 500 Argo airplanes with Hess Warrior engines. Both the engine and the plane are the products of the Alliance company.

The company's new plant, measuring 60 by 300 feet, has recently been completed. The factory was erected at the flying field operated by the company. Located two miles from the center of Alliance, this field consists of 139 acres and has a runway 3,500 feet in length.

**M.** A. (Jack) GORDY has been appointed district manager in the southeastern states for the United States Electric Tool Company of Cincinnati. Coöperating with jobbers and consumers, Mr. Gordy will have charge of sales and service of U. S. products in that district. His headquarters will be in Atlanta, Ga.

**T**HE hangar of the Thompson Aeronautical Corporation at Cleveland is being remodeled to provide a stock room and machine shop for the overhaul of aviation engines. These facilities are being provided as the result of a franchise granted by the Wright Aeronautical Corporation, by which the Thompson company has the exclusive sale of Wright engine parts in Cleveland and northern Ohio. A testing room will be erected as an annex to the present hangar. The company's stock room will carry parts for all types of Wright engines.

Herbert E. Smith will superintend the engine repair service. Edwin E. Thompson is president of the company; R. C. (Tex) Marshall, vice president and general manager; W. E. Close, treasurer; and W. M. Albaugh, secretary.

**T**HE following products are manufactured by members of the Armco Culvert Mfrs. Association, Middletown, Ohio.

Airport drainage; bridge floors, catchbasins and culverts, corrugated iron; culverts, paved invert; drainage gates; drains, perforated iron; siphons, storm sewers and stream enclosures, corrugated iron; street culverts, part circle; undercrossings and well casings, corrugated iron.

**W**ILLIAM H. CUNYAS, who was formerly in the Aviation Mechanics' School of the Great Lakes Training Station, has joined the staff of the Embry-Riddle Flying School, Cincinnati, as head of the ground school.

Carl R. Anderson, a former basketball star at Ohio State University, has also joined the Embry-Riddle staff. He will be instructor and director of recreation for students.

## IOWA AIR NEWS

By R. W. MOORHEAD

**P**RODUCTION of airplanes by the Bolte Aircraft Company will begin in Des Moines in a few weeks. Prof. Edward A. Stocker, associate professor of aeronautical engineering at the University of Michigan, is consulting engineer of the company.

**S**TATE legislation which will enable the city to purchase and operate the local airport, now leased by private concerns and the chamber of commerce, is being sought by Iowa City.

According to present plans, the field will be put under supervision of the city park commission. Purchase of considerable property adjoining the present airport is planned and an effort will be made to enlarge the field sufficiently to secure a triple-A rating by the United States Department of Commerce.

Erection of an aeronautics building at the landing field is also planned. The structure will have rest rooms and dining accommodations for air travelers and will also house the flying field offices and aeronautics club headquarters.

**T**HE Southern Iowa Airways, Inc., of Bedford, has been formed to operate airlines and lease airports in southern Iowa.

The company plans to use the air fields at the following towns: Bedford, Lenox, Clarinda, Shenandoah, Creston and Mt. Ayr, and to add other fields later. Also the company plans to operate planes on regular schedules between Nebraska City and Keokuk, and from Omaha to Lincoln.

The officers of the company are: Earl Downing, Clarinda, president; Clem Shaw, Bedford, vice president; Paul S. Dobel, secretary-treasurer; and Paul D. Anderson, Mt. Ayr, and Leo Caskey, Lenox, directors. Jack Beitman, pilot at the Bedford field, will be chief pilot for the company.

**T**HE League of Iowa Municipalities will sponsor and work for a bill in the coming legislature, which will authorize cities and towns to levy taxes in order to build and maintain airports.

As drafted, the bill would authorize a tax levy not to exceed 1 mill in cities over 50,000, and not to exceed 3 mills in cities over 10,000, and not to exceed 5 mills in cities less than 10,000.

## THE LEHIGH NATIONAL AIRPORTS COMPETITION

**T**HE Lehigh Portland Cement Company is conducting a national airports competition which is open to architects and engineers throughout the country. Designs entered in the contest will appertain to the erection of suitable air transportation terminals, permanent buildings thereon, and appurtenances to flying fields. A jury of award will choose the winning designs after the competition closes, November 1, 1929. The prizes have not yet been announced.

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with skis, wheels, pontoons.  
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haven't seen the  
show if you miss the  
**COLLEGIATE EAGLEROCK  
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Show

Help the  
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## CHICAGO AIR NEWS

By DUKE JORDAN

**CAPT. B. B. LITSNER** of Chicago is chairman of the Wilbur Wright memorial project. A monument to the first flier is to be erected upon the site of Wright's birthplace in Newcastle, Ind.

**DURING** 1928, N. A. T. planes flew 2,138,183 miles carrying 1,126,067 pounds of mail, 72,830 pounds of express and almost 13,000 passengers.

**MORE** than 100 passengers and 6,700 pounds of air mail were carried by Interstate Airlines between Chicago and Atlanta during the month of December, according to Commander Charles T. Blackburne, vice president and general manager. Department of Commerce airway superintendents are now surveying the route in preparation for the establishment of air beacons at 10-mile intervals, with intermediate landing fields located at every third beacon. Lighting of the route is expected to be completed by May 1.

**PASSENGER** air travel has been opened between Chicago and Rochester, Minn. Planes leave here at 9 a. m., and arrive at Rochester at 11:40 a. m.

**AN** air ticket office, the second in Chicago, has been opened jointly by Universal Air Lines and Western Air Express at 103 West Monroe Street, under the name of Air Line Ticket Office.

**AIR** mail from Louisville now comes into Chicago daily over Interstate Airlines. Mail leaves the Kentucky city at 8:30 a. m. and arrives at Evansville, Ind., at 9:45 to make a connection with the Chicago-Atlanta plane.

**WORLD WAR** fliers are invited to attend a reunion here February 22 under the auspices of Aviation Post No. 651 of the American Legion, according to an announcement by Michael M. Rubner, post commander.

**BREMEN LIGHT**, a 2,000,000 candle-power directional beacon, is now in operation on the tower of the Olson Rug Company's plant at Crawford and Diversey avenues on the northwest side of the city.

**FLOODLIGHT** towers at the Chicago Municipal Airport have been painted a yellow and black checkerboard design, which adds to their visibility at night and conforms to United States Department of Commerce regulations.

**THE** Greer School of Electrical and Automotive Trades will operate a ground and flying school. The company is establishing a flying field on Lake Street, west of Elmhurst. Capt. J. C. Bryan, war time pilot, is in charge of the ground and flying school. C. S. Laird is in charge of the motor and aircraft construction departments.

**AT** the Aviation Service & Transport Company's flying field, Capt. M. Rubiner operations manager, is superintending the operation of the first of a fleet of 50 Command-Aire planes which will be used for instruction purposes.

### Universal Aviation Corp. Activities

**COLONEL HALSEY DUNWOODY** has been elected executive vice president in charge of all operations of the Universal Aviation Corporation. Colonel Dunwoody was Assistant Chief of the A. E. F. Air Service and served as a member of the Interallied Aviation Commission.

Mason Peters has been appointed director of publicity of the corporation, with headquarters in Chicago.

The Universal is already one of the largest airline systems in the world, controlling such subsidiary companies as the Universal Air Lines System, Robertson Aircraft Corporation, Northern Air Lines, Continental Air Lines, Inc., Universal Air Lines System Terminal Co., Egyptian Airways, Inc., Robertson Flying Schools, Inc. The corporation has closely affiliated interests with the Western Air Express, Aviation Corporation of America, Pan American Airways, New York Central Railroad Co., and Greyhound Bus Lines. Universal also owns a large interest in the Fokker Aircraft Corporation.

L. H. Piper, of Minneapolis, is president; P. G. Kemp, of Chicago, is vice president in charge of traffic; and Col. Halsey Dunwoody is executive vice president and general manager. Among the directors are the following: George M. Pynchon, Jr., Pynchon & Co., New York; A. F. Pillsbury, Pillsbury Flour Mills Co., Minneapolis; Anthony H. G. Fokker, Fokker Aircraft Corporation of America, New York; William Thaw, Pittsburgh; Frank Phillips, president of Phillips Petroleum Co., Bartlesville, Okla.; Talton T. Francis, Francis Bros. & Co., St. Louis; John A. Hambleton, Hambleton & Co., New York; Walter W. Head, president of the State Bank of Chicago; and many other men of prominence in the financial and aeronautical world.

### Dark-to-Dawn Miami-Chicago Flight

**WHAT** is probably the first dawn-to-dark flight between Miami and Chicago was made January 10th by Pilot E. E. Ballough, flying with Charles Dickinson of Chicago in a Laird-Whirlwind L C-R. While in Miami, Ballough won both 800 cubic inch open cockpit races at the Miami airport dedication meet.

Mr. Dickinson, 71-year old Chicago aviation enthusiast and owner of the Laird-Whirlwind, accompanied his pilot to Miami. They left Chicago January 6th at 7:20 a. m. and landed at Nashville, Tenn., 2 hours and 55 minutes later. They left Nashville at 11:15 and landed at Jacksonville, Fla., at 2:50 p. m., having made the trip from Chicago to Jacksonville in 6 hours and 30 minutes flying time. Ballough and Dickinson hopped off the following day for Miami, making the 340 miles in 2 hours and 40 minutes. Fifteen minutes after completing the hop from Jacksonville on January 7th,

Ballough entered his Laird in the first race which he won. The following day he entered the same ship in the second race and again won first place.

On Thursday, January 10th, Ballough and Dickinson started their return trip to Chicago. Leaving Miami at 7:10 a. m., they landed at Jacksonville at 9:30 a. m. After refueling, they hopped off from Jacksonville at 10:18 and made Nashville, Tenn., in a single hop, having landed there at 2:55 p. m. Gasoline and oil supply replenished, the final hop to Chicago was started at 3:11 p. m. The landing at Chicago was made shortly after dusk, at 6:15 p. m., Eastern Standard Time, 5:15 Chicago time. The total flying time for the 1,260-mile trip was 9 hours 59 minutes.

**CAPT. LESTER D. SEYMOUR**, formerly chief engineer and general manager of National Air Transport, Inc., has been promoted to general manager of that company. Capt. Seymour has been associated with N.A.T. since 1926, prior to the beginning of actual operation. Col. Paul Henderson, who was general manager previous to Capt. Seymour's promotion, remains as active vice president of the company.

During 1928, N.A.T. planes carried 1,126,067 pounds of mail, 72,380 pounds of express and nearly 13,000 passengers. During the year, too, the daily mileage flown by N.A.T. planes increased from 5,000 to 6,200 miles per day.

### Continental Merges with Universal

**THE** Universal Aviation Corporation has acquired control of the airway system operated by Continental Air Lines, Inc. Continental Air Lines operates the air mail route from Cleveland to Louisville, via Akron, Columbus, Dayton and Cincinnati.

**WESTERN FELT WORKS** is supplying a number of aircraft manufacturers with felt for lining gasoline and oil tanks and for insulating cabin planes against variations in temperature. The company is now developing a pad to fit between the engine and pilot's cockpit which is intended to decrease in the cabin the noise and vibration of the engine.

## ILLINOIS AIR NEWS

**AT** a meeting held recently in Bloomington, representatives of twelve Illinois cities framed a bill, providing a means by which flying fields and airports may be developed in every city and town in the state. This bill, which will be presented to the state legislature, would give every Illinois community the right to levy a tax of one mill on each dollar of taxable property for the purchase, development and maintenance of land for an airport, and at the same time, would give city councils, etc., the right to exercise the power of eminent domain in procuring the land for the field.

Charles Zweng, president of the Bloomington Flying Club, presented the bill to the meeting. James Meeks was chairman of the conference.

## KANSAS CITY'S All Weather Airport

### Easy to Take Off and Land At .... Fairfax Airport

Fairfax Airport, characterized by fliers as America's finest natural airport, is an all-weather flying field.

The well drained, level 300-acre area presents no unusual landing difficulties even in rainy weather.

Accessibility from the air is an outstanding feature commending Fairfax to all fliers. Planes may approach or depart from any direction without the menacing obstruction of tall buildings, smoke stacks or topographical hazards.

Ample facilities for personal convenience and mechanical needs await the flier at Fairfax. Attendants are always ready for refueling and repair service.

Just ten minutes from the shopping district of Kansas City, Fairfax could not be more conveniently located for the air traveler. And at the flier's disposal is a car to take him to his uptown destination.

Fliers know Fairfax Airport for its accessibility, safety and convenience.

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For your specific information Woods Brothers Corporation will furnish industrial, labor and marketing surveys, traffic and freight rate data and information as to plant financing aid in the Woodsworth and Fairfax industrial districts in Kansas City.



## WICHITA AIR NEWS

By EDWIN W. PRYOR

**T**HE WASP company holds the contract for servicing the Fokker planes passing through Wichita on their way to the coast for the Western Air Express.

**T**HE Travel Air flying field, located east of the city, has been purchased from the city by the Travel Air company. Under a previous arrangement, the city maintains the port and polices it until July 1, when the municipal airport at the California section, southeast of the city, is ready for opening. Joe Patterson remains as manager of the field until that time. The field is a quarter of a section in size and is well-drained.

The new California section is a mile square and will be completely equipped and developed by the city under a bond issue recently passed.

**A** COMBINATION passenger and mail biplane, powered with a 525 horsepower Cyclone, is being developed by Stearman Aircraft Company for the Robertson Air Lines of St. Louis. That firm has ordered three for delivery in the spring. The ships will carry four passengers and a pilot, and will have a mail compartment of 44 cubic feet, and will be readily convertible into all-mail ships.

**S**TEAMMAN AIRCRAFT COMPANY is publishing a house organ, called "Contact." The first issue was released December 28.

**C**URTISS QUICK, formerly motor engineer with Cessna Aircraft Company, has moved to El Paso, Texas, where he has accepted a position with Sam Watkins, the Cessna dealer there.

**T**HE Topeka Aeronautical Service, recently organized at Topeka, Kan., plans the production of a tiny, single seater parasol type monoplane. The first ship will be turned out in a few weeks, and it is expected production will be stepped up to three planes a week in a short time.

**A** \$15,000 hangar for the Air Service, Inc., is under construction at the Travel Air flying field. It is of steel and stucco construction, 76 by 80 feet, and will have an addition for offices, as well as a lean-to machine shop.

**A** LOW-WING semi-cantilever monoplane of the parasol type is being constructed by the Excelsior-Henderson Cycle Company of Wichita. This plane will employ the 32 horsepower motor developed by the firm. A. E. Riggs, formerly with Cessna Aircraft Company, designed the ship.

**A** TWO-PASSENGER open cockpit training plane, to utilize the new 150 horsepower Wright motor, is being developed by Stearman Aircraft Company.

Other types announced are a four-place cabin job, powered with the Wright 300 horsepower motor or the Wasp; a small cabin plane, using a 150 horsepower Comet;

a light transport using a Cyclone; and a speed mail plane powered with a Cyclone. The three-seat standard job will use either the 225 or the 300 horsepower Wright engine.

**T**HE first four-place cabin biplane of the Knoll Aircraft Company recently satisfactorily underwent its test hops, and plans are under way to put the factory on a production basis.

The company has purchased land near the Travel Air field for a flying field and factory site, and construction on the main unit is being pushed rapidly.

**C.** E. CLARK, chief test pilot for Travel Air, Inc., recently set a Wichita altitude record when he flew a Wasp-powered monoplane to a height of 18,000 feet. Instruments showed the temperature outside of the plane as 35 degrees below zero, but inside the plane, according to H. R. Rawdon, chief engineer, who accompanied Clark, the temperature was comfortable "without a coat."

**A.** J. EDWARDS, well-known figure in the aviation world, has accepted a position as general manager of the Swift Aircraft Company, maker of a small, two-place training or sport job. He formerly was connected with Prudden, and Ryan, on the West Coast. He replaces Walt Anderson, vice president of the firm, as general manager.

The Swift company has acquired a factory of brick construction on the new municipal airport, and construction of a hangar and paint room is being rushed.

The company is awaiting a Department of Commerce certificate for the ship before it begins heavy production.

**J.** AY SADOWSKY, flying in a new Swallow TP, the small training plane recently placed on the market, has set an OX-5 altitude record for Wichita. He flew the ship up to 15,000 feet, topping the former city record more than 2,000 feet.

**S**WALLOW AIRPLANE COMPANY is entering the closed job field, it was announced recently. Plans for a cabin biplane to be powered with the new 225 horsepower Wright motor are under way. The cabin job will be the third of three types to be concentrated upon by Swallow this year—the others are the small TP training plane, and the three-place open job powered with the Whirlwind. It is hoped to have one of the cabin jobs completed in time for the Detroit show in April.

F. C. Barchard, new sales manager, is strengthening the sales force of the company and acquiring steadily more agents and distributors.

### Travel Air Company's New Buildings

**T**HE Travel Air Mfg. Co., Inc., has recently moved its executive offices to its new administration building. The building is approximately 50x80, affording large and modernly equipped private offices for the board of directors and Walter H. Beech, president; for the district sales managers;

for the office manager and the entire office personnel. The rapid growth of Travel Air has made necessary the occupancy of these new and enlarged executive headquarters. A large and commodious reception room in this new building amounts almost to club headquarters for visiting pilots as well as for those who stop at the Travel Air field for business or pleasure. Weather reports from all points of the compass are instantly available to anyone who wants them; company courtesy motor cars are always in readiness for visitors and friends.

Work on the third unit of the Travel Air factory, of the same size as Units A and B, is being rushed in order that the new building may be devoted to the increasing manufacturing activities of the company.

The factory is on double shift—night and day—to try and catch up with the large volume of orders that are steadily coming in. These orders are not only for demonstrators to dealers and distributors, but represent purchases by dealers and distributors for delivery to prospects whom they have already sold this year.

### New Braley School Buildings

**C**ONSTRUCTION of three new buildings to house the Braley School of Flying was begun early in January on the recently acquired 310-acre tract just north of the Travel Air factory. The group will include a one-story administration building, where the company will have its headquarters and conduct its ground school. Measuring 100 by 150 feet, this building will be constructed of brick with steel sashes and trusses.

The hangar building, another of the group, will also be of brick construction and will be 50 by 300 feet in dimensions. It will be divided into six separate hangar sections.

The third building will be a dormitory, 54 by 250 feet, where two hundred students will be lodged. There will be a large lobby in the dormitory.

The company also proposes to build at the field a factory for the manufacture of a plane designed by Thomas E. Braley.

The officers of the Braley School of Flying are: Ted Braley, president; George H. Siedhoff, vice president; A. R. Leapley, treasurer; Jesse D. Wall, secretary; and Thomas E. Braley, chief of the ground school.

## KANSAS AIR NEWS

By E. B. CHRISTOPHER

### Kansas City

**F**AIRFAX flying field, until recently operated privately by an aviation school, is to be enlarged from 200 to 800 acres as an open airport.

Since its opening to the public, another large flying school has taken up headquarters at Fairfax field, ground has been broken for a new airplane factory, and a 20-plane hangar is under construction.

When enlarged, Fairfax Airport will parallel the Kansas City airport, across the Missouri River, for part of its length. The combined area of the two fields will be about 1,500 acres. (Continued on next page)

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*We will give you a Permanent Job upon completion of your Course if you Qualify,*

Our affiliated company wants you and one hundred and fifty other properly trained, qualified men to work in its metal monoplane factory at full time positions!

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tion if he can qualify! You will have permanent work—the jobs aren't the kind that "run out" in a day or so!

Production has to be started immediately on this latest, efficient type monoplane and Marshall Graduates get the salaried positions in the order of their graduation.

Think it over! This is your chance to get into the most fascinating of careers. By accepting our offer now and training before March, you have a guaranteed future!

In addition to getting a job in this monoplane factory, you get the most thorough and complete aviation training course offered anywhere and at the lowest tuition rates in America.

Marshall Flying School, "The College of the Air," can not be considered as a trade school. Training is scheduled and conducted strictly on a university basis. And only at the "College of the Air" can you get departmentalized instruction in regular courses based on university methods.

Only at the "College of the Air" can you get training on all the popular types of new training planes; only at the "College of the Air" can you get the complete, thorough, practical training and well-taught theoretical instruction! And only at the "College of the Air" do you get 300 hours of such quality ground instruction free with your flying course.

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(Kansas Air News continued)

Fairfax Airport is ideally situated, surrounded by much level land suitable for emergency landings. It is only a few minutes' drive from the business districts of Kansas City, Kans., and Kansas City, Mo.

Fairfax field is owned and is being developed by Woods Bros. Corporation.

#### Emporia

A GROUP of air-minded business men of Emporia is trying to arrange the leasing of a 130-acre tract for use as an airport, and it is planned to organize a flying school and an air transportation company.

Emporia is only five miles north of National Air Transport's Kansas City-Dallas route, and it is hoped that eventually Emporia will be made a stop for air mail and passengers on this route.

#### Hutchinson

HUTCHINSON recently voted a \$75,000 bond issue for a new municipal airport, but as yet no site has been selected.

According to present plans, \$40,000 to \$50,000 will be spent for at least 240 acres and the balance for equipping the field, lighting, etc.

In the meantime, pilots find excellent service in Hutchinson at Albright Airport. Gas and oil are on the field and hangars to accommodate four ships. Albright Airport is located on one of the main highways just a mile and a half southeast of the business district. Mr. and Mrs. W. E. Albright, who operate the field, give you service with a smile, and every pilot who has ever been in this vicinity remembers the large four-way field that will accommodate anything from an OX to a multi-motored transport.

At present Hutchinson Airways are using the Albright field for their school and taxi work. They have two OX-5 Travel Airs and an LS-5 owned by their instructor Quinn. Rupert Wright has charge of service and engine instruction for the school.

#### Spearville

ALTHOUGH there is not a regular airport at Spearville, there are several good, level fields, within a half mile of town.

At present R. A. (Hap) Burt, well-known pilot of Eldorado and Wichita, is operating an OXX-6 Winstead Special, using a 50-acre field one quarter mile west of town and just south of Santa Fe R. R. and Santa Fe Trail highway.

#### Dodge City

AN aviation school has been organized in Dodge City, which is known as the Dodge City School of Aeronautics. Leslie Stark and George Yunker, of the Yunker Company, are the owners, and Bob Townsend is chief instructor. At present about 25 students are enrolled. The school uses McCoy Airport which is only a mile north of the city.

A. L. Willis also operates from the McCoy field, giving instruction and taxi service in his OX-5 Eaglerock.

The chamber of commerce recently installed a rotating beacon at the McCoy field.

WORK is already under way for the lighting of the route from Dodge City to Wichita to be used by Transcontinental Air Transport when it inaugurates its service early this spring. The new T. A. T. field at Dodge City will be five miles east of McCoy Airport and will contain 640 acres. The site was recently acquired by T. A. T. for approximately \$28,000. On this field will be located the shops and hangars of the transport company, for servicing and taking care of their Ford trimotor transports.

It is rumored that the Yunker Company of Dodge City is shortly to commence the manufacture of a new plane designed by Felix W. A. Knoll of the Knoll Aircraft Co., of Wichita. The company plans to erect a factory in Dodge City.

#### Ulysses

A HANGAR has been erected on the field at Ulysses adjacent to the race track. Jimmie Woods operates an OX-5 Swallow from this field.

#### Independence

THE Independence Air Transport Company is operating its Stinson monoplane from the new field five miles north of Independence. The company has several students enrolled in its school and is giving instruction on an OX-5 Standard and an OX-5 Swallow. Pilot Norton is chief pilot.

#### Salina

THE city commissioners of Salina recently purchased a 160-acre tract for a municipal airport two miles south of town. It is planned to have the field equipped and ready for use before spring.

THE first ship built by R. A. Rearwin of Salina is nearing completion. It is a 3-place open cockpit biplane powered with the Curtiss Challenger 170 horsepower engine.

#### Eldorado

ALL pilots are welcome at Skelly Oil Company's field at Eldorado. It is a square 80-acre tract on a paved highway two miles south of town. The Skelly Oil Company owns a Spartan with a Ryan-Siemens engine. The ship is flown by Ray Thies.

R. A. Burt also operates an OXX-6 Super Standard off this field.

#### Larned

JOHNSON and S. C. Clinesmith, president of the Larned Chamber of Commerce, have been on several hunting trips recently in Johnson's American Eagle. Pilot Johnson is manager of Larned's airport.

## INDIANA AIR NEWS

By H. GENE HAYNES

A RESOLUTION has been adopted by the Indianapolis board of public works requesting a city council bond issue of \$692,000 for its new municipal airport.

Approximately \$267,335 will be spent for 1,000 acres of land for the project. Other expenses are: acquisition \$5,000; topographical survey, \$4,720; drainage, \$50,000; miscellaneous grading, \$5,000; clearing

\$4,000; two oil gravel roadways 100 feet wide with a total length of 7,400 feet, \$100,000; pavement, walks and drives, \$40,000; administration building and control tower, \$100,000; two hangars, \$30,000; garage and gasoline service station and equipment, \$8,000; equipment in the nature of trucks, mowers, tractors, grading machine and maintenance equipment, \$5,000; lighting system \$20,000; fencing \$3,000; and maintenance and operation for one year, exclusive of revenue, \$20,000.

BUSINESS affairs of the Transcontinental Air Transport, Inc., to be inaugurated April 1, with Indianapolis as a junction point, will be handled in this city by the Curtiss Flying Service of Indianapolis.

Officers of the Curtiss company are James A. Perry, head of the Indianapolis baseball club, president; C. S. (Casey) Jones, and Captain H. Weir Cook, vice presidents; Paul Rickey, advertising agent, secretary; and J. A. B. Smith, treasurer. Directors are Norman A. Perry, president of the Indianapolis Power and Light Company; G. M. Williams, Marmon Motor Car Company; J. A. Perry, and Captain Cook.

The Curtiss Flying Service has arranged with the Indiana board for the company's use of the airport of the Indiana National Guard at Mars Hill.

TENTATIVE plans for the opening of three new airplane passenger lines and the extension of the present Detroit-Indianapolis line to include Evansville have been announced by Lieut. E. H. Jose of the Capitol Airways, which operates three passenger lines out of Indianapolis. The new lines will run from Indianapolis to Cleveland by the way of Dayton and Columbus O.; to St. Louis by way of Terre Haute and to Cincinnati. Two trips will be made daily.

## INDIANAPOLIS NEWS

By FRANCES HANNA

COMMAND-AIRE planes will be distributed by the Silverwing Aircraft Corporation of this city in a territory including Indiana, Ohio, West Virginia, Kentucky, and Illinois (except the Chicago territory). The contract calls for the delivery of 50 planes in 1929. It also covers the dealership for Phylax Automatic Fire Extinguishers, for which Command-Aire, Inc., holds sales rights in North America.

THE Silverwing Aircraft Corporation, which will operate from Stout Field, Mars Hill, was incorporated in December by several Indianapolis business men for the distribution of aircraft. The officers are: president, Col. John S. Fishback; vice president, Major Richard F. Taylor, commander of the 38th Division Air Squadron; secretary, Ulysses Jordan; and treasurer, Lieut. John L. Wamsley.

THIS city's only air travel service bureau will be established about February 1st by L. Strauss & Company, leading men's clothing store, which carries a full line of aviation clothing equipment for the pilot and air traveler.

# B. B. T. FLOODLIGHTS

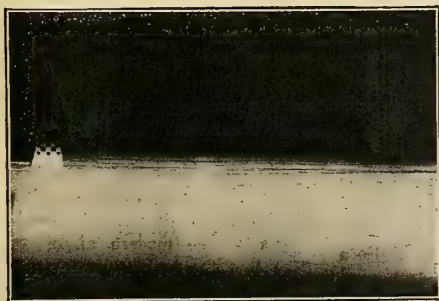
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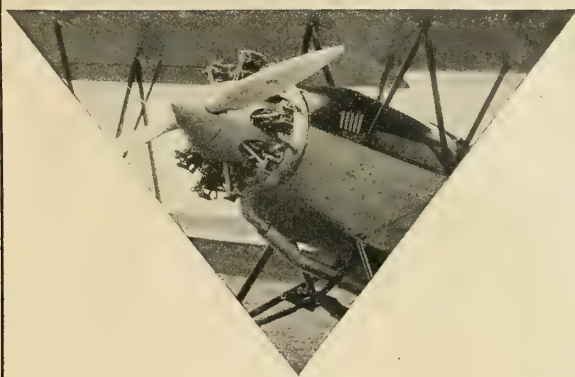


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*"The Old Siemens  
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Thus Miss Viola Gentry expressed her confidence in a dropped message shortly before snow and fog forced her to land after a fine endurance flight of 8 hours, 6 minutes and 37 seconds.



Richard E. James, the American boy who won the \$1,000 prize offered by the American Society for the Promotion of Aviation for the first youth to fly the continent, used a Siemens-Halske powered Travel Air. When he finished his flight at Curtiss Field, the Siemens "was still going strong."

These two examples of the reliability of the Siemens-Halske Type SH 12, 9 cylinder, 125 H.P. recommends it to both the commercial and sport flyer.

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Consulting Engineer

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Architect's drawing of Detroit's new \$2,500,000 Aircraft Exposition Building

## DETROIT AIR NEWS

By FRANK BOGART

AFTER building 186 airplanes in 1928, nearly two and one half times the output of the year before (the 1928 products sold for \$3,700,000), the Detroit aviation situation for 1929 shapes up about as follows:

1. Stinson Aircraft Corporation will be in its new plant (80,000 square feet) on the Detroit-Wayne Industrial Airport by March 1, where it will produce a line of six models. Ninety-five machines were built and sold in 1928.

2. Ford Motor Company will continue to turn out three transports weekly until May 1, when production will increase to one a day. Both the 600 and 1,200 horsepower machines are now being built and a 900 horsepower type will soon appear. No plant extensions are prophesied. One thousand men are now at work in the airplane shops, as against 160 a year ago. 1928 production was 51.

3. Buhl Aircraft expects to more than triple its 1928 production of 40 ships, and Verville Aircraft Company, after test flights of a four-passenger air coach in December, stated that a production schedule would be announced by the time of the All-American Aircraft Show, April 6.

4. The aircraft engine production is not so easy to estimate. Warner Motor announces its 1929 production is all contracted for but does not state the amount. A new plant is being put up. Stock of this new concern rose from 130, an amazing opening price, to 200 on the very first day of its appearance on the Detroit Stock Exchange. Continental Motors, Inc., is starting production of a seven-cylinder radial, air-cooled engine under direction of Robert Insley, former plant chief of the Air Corps engineering section in Dayton. Packard may at any time launch into production of its oil-burning type.

**STOUT AIR SERVICES, INC.**, hauled 46,563 passengers in 1928,—6,312 on its two airlines to Cleveland and Chicago (the latter two months only), and the balance on aerial tours. Mileage totalled 251,164, nearly double that of the preceding year.

The extension of the line to Cleveland into Pittsburgh and Philadelphia waits only on the establishment of a suitable terminal field in the former city.

THE Ford Motor Company's private air fleet has passed the million mark in mileage since its inauguration April 13, 1925. Last year, the planes flew 278,943 miles and carried 1,674,043 pounds of freight and mail—no passengers allowed.

FEBRUARY 4 was the opening date of the new ground school of the Curtiss Flying Service of Michigan, Inc., at the Grosse Ile circular airport, under the general managership of C. V. Burnett and the directorship of Dr. W. S. Gerhardt, first graduate of the University of Michigan aeronautical engineering course in 1927.

QUARTERS of the Detroit Flying Club have been established at 1301 Griswold Building; dues have been raised from \$15 to \$25; and the club as a unit has joined the N. A. A. Fred Black, advertising manager of the Ford Motor Company and a private pilot, has been named to the new and enlarged directorate under President Gaylord Norton, who is a business man flier.

MICHIGAN and Ohio are in a neck and neck race for fourth place in the number of airplane owners. Michigan led with 259, three more than Ohio, when the new year opened. There are 1,000 students under flight instruction, including many of the 400 young men in the aeronautical courses of the state's colleges and high schools.

THE sport of gliding and building motorless planes is making strides hereabouts. The Department of Commerce has licensed the first two models of the American Glider Association, which is under the presidency of Harry Karcher, of Dearborn, a Ford engineering employee. Successful tests have been made of other machines built by Gliders, Inc., a Detroit concern. The National Gliders Association, formerly called the Evans Glider Clubs of America, reports the formation of new branches in many sections. There will be a series of state tournaments in the summer culminating with a meet for a national trophy offered by Edward S. Evans, millionaire sportsman and air enthusiast.

ON January 8, William S. Brock and Edward F. Schlee, the Detroit to Tokio fliers and holders of the American airplane endurance record of 59 hours, made the first non-stop Detroit to Miami flight. While in the South, they will probably go after a new world's endurance record, and

their rival, Edward A. Stinson, twice holder of the world record, will at the same time be attempting the same thing on the ice of Saginaw Bay, 100 miles north of Detroit, in a new and specially built plane.

### First Permanent Aircraft Exposition Building

CONTRACTS have been let by the City of Detroit for the construction of the first permanent aircraft exposition building in the country. It is to be erected on the new Detroit City Airport, French and Lynch Roads, at a cost of \$2,500,000.

Every effort is being made by city officials to insure completion of the project in time to permit use of the new building for the second All-American Aircraft Show, April 6-14. Although contractors are under bond to complete their work in time for the show, the Detroit Board of Commerce, sponsor of the exposition, has guarded against last minute failures by leasing Convention Hall, in which the first All-American Show was held last April.

Lack of head room, interference of pillars, inadequate width of entrance ways, and above all, lack of sufficient floor space, are among the chief shortcomings of the average exhibition building for aircraft exhibitions.

An aircraft palace on an airport, enabling the manufacturer to fly his entry to the very gates of the show, is an ideal combination for the welfare of the industry at large.

Plans call for a building with a floor area of 300,000 square feet, in addition to administration buildings, restaurants, rest rooms, ticket offices, air mail offices, a meteorological department, and other adjuncts of the modern airport. There is hope that the building will pay for itself, because, during 50 weeks of the year, it will be used for storage space for airplanes, for aircraft salesrooms, and for other income-producing purposes. During the remaining two weeks, it will house the All-American Aircraft Show, should that exposition become a fixed annual event.

The city administration of Detroit concurred whole-heartedly in the proposal. The \$2,500,000 expenditure was authorized without delay, to be taken from a \$5,000,000 airport bond issue recently approved.

THE Stinson School of Aviation supports a basketball team and recently issued challenges to all first class teams in this district. Charles E. Haust, flying instructor, is manager of the team.

(Continued on next page)

## THE PITCAIRN SUPER-MAILWING

*is*

*Economical in Maintenance—*

Economical maintenance is of fundamental importance in the operation of aircraft.

The Pitcairn Super-Mailwing has been designed so that all parts requiring periodic inspection are readily accessible. The electric conduits for wiring lights and between engine and cockpit, tachometer shafting, bank and turn indicator tubing, etc., lie under zipper fastenings, permitting inspection



*Detail of zipper fastening along side of fuselage*



tion and replacement without damage to the fabric.

The Pitcairn Super-Mailwing, although essentially a high-speed cargo ship of large payload capacity and marked maneuverability, can also be furnished with the forward compartment converted into a spacious passenger cockpit with full dual control,

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(Detroit Air News continued)

**All-American Aircraft Show Entries**

UP to January 10th, thirty-seven manufacturers had entered a total of seventy-one airplanes for the second annual All-American Aircraft Show, and space reservations had been made by sixty three accessory producing concerns.

The Detroit show dates are April 6-14.

Following is a list of aircraft entries received up to that date: Advance Aircraft Co., Troy, Ohio; Alliance Aircraft Corp., Alliance, Ohio; Aeromarine Klemm Corp., New York City; Aircraft Development Corp., Detroit; American Eagle Aircraft Corp., Kansas City, Mo.; Bellanca Aircraft Corp., Wilmington, Del.; Berliner Aircraft Co., Inc., Alexandria, Va.; Buhl Aircraft Co., Marysville, Mich.; Butler Aircraft Corp., Kansas City, Mo.; Cessna Aircraft Co., Wichita, Kans.; Chance Vought Corp., Long Island City, N. Y.; Cunningham-Hall Aircraft Corp., Rochester, N. Y.; Curtiss Flying Service of Michigan, Detroit; Driggs Aircraft Corp., Lansing, Mich.; General Aircraft Corp., by its distributor, Wolverine Flying Service, Lansing, Mich.; Hamilton Metalplane Co., Milwaukee, Wisc.; Invincible Metal Co., Manitowoc, Wisc.; Kreider-Reisner Aircraft Co., by Skyways, Inc., Flint, Mich.; E. M. Laird Airplane Co., Chicago; Lenert Aircraft Co., Pentwater, Mich.; Mahoney-Ryan Aircraft Corp., by Knapp Flying Service, Ann Arbor, Mich.; Metal Aircraft Corp., Cincinnati, Ohio; Mohawk Aircraft Corp., Minneapolis, Minn.; Moth Aircraft Corp., New York City; Overcashier Aircraft Mfg. Co., Detroit; Paramount Aircraft Corp., Saginaw, Mich.; Pitcairn Aviation, Inc., Philadelphia; R. A. Rearwin Airplane Co., Salina, Kans.; Simplex Aircraft Corp., Defiance, Ohio; Stearman Aircraft Co., by Skyways, Inc., Flint, Mich.; Stinson Aircraft Corp., Northville, Mich.; Stout Metal Airplane Co. (Division of Ford Motor Co.), Dearborn, Mich.; Swallow Airplane Co., Wichita, Kans.; Swift Aircraft Corp., Wichita, Kans.; Spartan Aircraft Co., Tulsa, Okla.; Travel Air Mfg. Co., Wichita, Kans.

ARTHUR SOWDON, who was a war-time flier and later engineering officer at Miller Field, Staten Island, N. Y., has been appointed director of aviation sales for the Detroit Steel Products Co. The company manufactures airplane hangar doors and steel windows.

HOWARD J. HEINDALL, technical demonstrator and service man, and Louis Pereny, aviation chemist, have been added to the aviation division of Berry Brothers, Inc., manufacturers of aircraft finishes. Heindall will act in an advisory capacity for manufacturers who wish consultation on aircraft covering and finishing. Pereny will devote his time to research and improvement of aircraft finishes.

IN order adequately to meet increasing demands in the aircraft industry, Berry Brothers, Inc., is constructing a new factory unit for the production of aircraft finishes. This plant will be completed some time during the spring.

**WISCONSIN AIR NEWS**

By WILLIAM SCOLLARD

IT is estimated that Milwaukee's aeronautical industry during 1929 will produce aircraft and accessories valued in the millions of dollars. The range of products will include airplanes, propellers, pontoons, motors, helmets and fliers' clothing, paints, motor oil, hangars, wind indicators, landing lights, tires, parts, supplies and incidentals.

The Hamilton companies alone anticipate a business of \$3,000,000 and are in process of expanding plants and equipment. The Hamilton Aero Manufacturing Co. is undertaking a production rate of fifty propellers a day. The year's schedule contemplates more than \$1,000,000 worth of business. A new plant with 68,000 square feet of floor space is being occupied and equipped at present.

During 1928 the company made 1,100 metal propellers and 2,500 wooden propellers, which sold for \$650,000. The Hamilton Metalplane Co., following a \$600,000 year, in which 25 duralumin cabin monoplane were sold, expects to make from 50 to 100 planes in 1929, selling at an average of \$23,000 each, or a total volume of \$1,000,000 to \$2,000,000.

MANITOWOC'S own airplane, the product of the Invincible Metal Furniture Co., of that city, is expected to be ready for its trial flight by the end of January. The plane is a three-passenger dual control cabin machine. The plane is powered by a LeBlond seven-cylinder air-cooled 90 horsepower motor. The front of the new plane is covered with metal and will have a metal nose of the standard type.

WORK has been started on the construction of a 60 by 40-foot hangar at the Neenah airport, owned by H. H. Held. In the spring, a second and larger hangar is to be erected.

CHARLES SCHMIDT has been appointed manager and chief pilot at the Mosinee airport, operated by the Mosinee Airport Co. Winter activities are planned, with a plane equipped with skis for landing on snow and ice.

C. E. WERNIG has been elected president of the recently formed Brown County Airport, Inc., at Green Bay, Wis. Other officers chosen include Frank Bogda and Frank Buth, vice presidents; Earl E. Fisk, secretary; and Milton Smith, treasurer. In addition to the officers, the members of the board of directors are O. W. Brightman, John S. Farrell, Forrest G. Plott, A. R. Burton, James Stathas, C. P. Jackson, H. M. Kuypers, R. H. Drum, W. A. Kruger and S. D. Hastings, Jr.

RUSSELL J. McNOWN, formerly chief pilot of the Tri-City Airways, Inc., Wisconsin Rapids, is now associated with the Hamilton Metalplane Co., Milwaukee, as Michigan representative of the concern. His headquarters will be in Detroit.

THE city council at Appleton, Wis., has appropriated \$2,000 for the lease of an airport to be used jointly by Appleton, Neenah and Menasha on the Fox River Valley air-mail route. The proposed site of the landing field is the port of the North American Airways Co., between the three cities.

THE Aviation Service League, Inc., is a new Wisconsin corporation formed in Milwaukee. Signers of the articles of incorporation are Andrew L. Schaidler, Charles J. Dott and Elmer U. Gross.

THE Husky Corporation manufacturer of socket-wrenches and tools, is now located in its new factory at Kenosha. The factory building, which contains 40,000 square feet of floor space, is constructed of brick, concrete and steel. An attractive office building is situated in front of the factory.

A PROPOSED aeronautical law has been drafted which is to be presented at the next session of the Wisconsin State Legislature by Senator Oscar Morris of Milwaukee. The law would make it unlawful in Wisconsin for any pilot without a transport or limited commercial license issued by the Department of Commerce, to fly an airplane carrying a pay passenger. A further provision makes it unlawful to fly a plane at all without a certificate of some kind from the Department of Commerce. Moreover, every pilot must have his certificate on his person at the time he is flying, and every plane flown in Wisconsin must be licensed by the Department of Commerce.

The law was drafted by Stuart F. Auer of Milwaukee.

**SUPERIOR AIR NEWS**

By ARTHUR G. PATTERSON

POWER lines and telephone lines located on the north side of the Superior, Wisc., municipal airport, at Billings Park, are to be relaid under ground in order to make the airport safer for fliers.

Improvements recently completed at the Superior municipal airport include filling in of runways with dirt and installation of considerable culvert pipe.

A NEW air mail route between Superior, Winnipeg and Milwaukee is now under consideration. Those behind the proposed airline are the Tri-City Airways, Inc., of Wisconsin Rapids, and the Nekoos-Edwards Paper Company, also of Wisconsin Rapids. The new line would start at Winnipeg, Canada, and pass through Superior, Ladysmith, Wausau, Marshfield, Wisconsin Rapids, Appleton, Fond du Lac, and Milwaukee.

TWO landing fields are available at Superior: the Coolidge Field near Parkland, a short distance outside of Superior, which was used as a landing field for mail and Army official planes during President Coolidge's vacation on the Brule River near Superior, and the municipal air field located at Billings Park.

## Such Achievements As These Are Unquestionable Proof of Superiority

**T**HE fineness of Hamilton Propellers has turned every-day performance into a record of achievement that is unique in the field.

*In the National Reliability Tour*—fifteen out of the twenty-four planes that finished were Hamilton-equipped—the first place—and seven out of the first ten were won by Hamilton propelled planes.

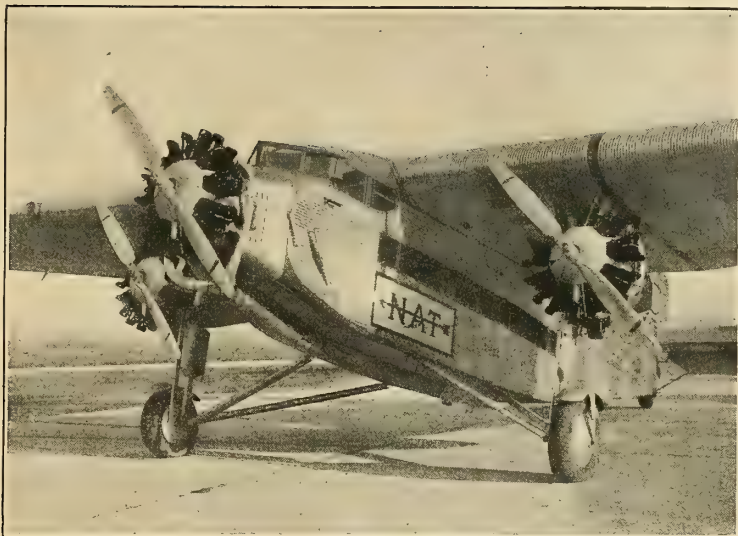
*In the Class B Transcontinental Race, New York to Los Angeles*—Hamilton Propellers won first, second, third and fourth places.

*In the Class A Transcontinental Race*—eleven out of the twenty planes had Hamilton Propellers.

Hamilton Propellers won the Detroit News Air Transport Trophy and the Aviation Lawn and Country Club Trophy for efficiency last year. They played an important part in the Transcontinental Sweepstakes . . . and the International Race from Windsor, Ontario to Los Angeles, Calif.

There are Hamilton Propellers for every type of ship.

**Hamilton Aero Mfg. Co.**  
Milwaukee, Wis.



**HAMILTON**  
**PROPELLERS**

# Look INSULATED

## HASKELITE plywood for aircraft

**A**LTHOUGH HASKELITE and PLYMETL possess the same insulating quality as wood, specially insulated panels with cores of Balsa wood, Celotex, Masonite and similar materials are now being produced. Samples of these insulating panels were shown at the Chicago Exposition.

Builders of aircraft greeted the new insulating panels enthusiastically and are planning to utilize their added insulation, combined with

great strength, and light weight for floors and walls to meet the flying public's demand for all weather comfort and durability. The Army plane "Question Mark" which recently broke all endurance records has a HASKELITE balsa floor. No more striking demonstration of the value of this floor construction could be found. 85% of plywood now used is HASKELITE.

Aircraft engineers and builders can secure blue print booklet of aircraft applications on request. It's free—but it's valuable.



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## MINNESOTA AIR NEWS

By W. S. SCHLEY, JR.

**B**OTH Minneapolis and St. Paul are placing before their respective city councils plans for the enlarging and improving of the airports and facilities.

George C. Sudheimer, St. Paul's commissioner of finance, proposed that the city acquire \$300,000 in improvements for the national guard's housing facilities, \$100,000 of which would be for hangar space for the 109th aero squadron at the municipal air field.

As soon as the \$500,000 provided for in the United States Improvement Council's program is available, further development of the St. Paul airport will start.

The field will be extended to the south to provide an all-way flying field with a circumference of 2,500 by 2,500 feet.

Minneapolis' park board plans an improvement program costing \$900,000 for the Wold-Chamberlain air field. Theodore Wirth, superintendent of Minneapolis parks, says the proposed plans include acquiring additional property so that the field will consist of 500 acres; removing a concrete oval which is part of an old race track; construction of an administration building; construction of eight runways and installation of complete lighting and water systems.

**A** SERIES of winter airplane excursions to Brownsville, Texas, will be made by the Universal Air Lines, Inc.

The tour will be made in a twelve-passenger trimotored plane. Passengers will

spend three days in the gulf territory and the rest of the time in an air tour of the lower Rio Grande region.

## DULUTH AIR NEWS

By ARTHUR G. PATTERSON

**A**T a meeting of the Minnesota Association of Commercial Secretaries held in Minneapolis in January, an air code consisting of an act covering the licensing of airmen and aircraft and a separate act authorizing cities, towns, villages, and counties to establish airports governing the entire state of Minnesota were drafted and are to be presented for consideration to the 1929 Minnesota State Legislature now in session in St. Paul. A significant feature of these two acts is that they do not place any financial burden on the State of Minnesota.

The committee in charge of the forming of the two acts comprising the code were as follows: Henry F. Dooley (chairman), secretary of the chamber of commerce of Faribault, Minnesota; J. S. Lincoln, industrial secretary of the Minneapolis Committee and aviation secretary of the Minneapolis Civic and Commerce Association; J. R. Pratt, assistant secretary of the Duluth Chamber of Commerce; Stanley Partridge, chairman of the aviation committee, Minneapolis Civic and Commerce Association, and president of the Minneapolis N. A. A.; C. E. Doell, secretary, Minneapolis Park Board; Paul Goldsborough, vice president of Universal Air Lines; C. W. (Speed) Holman, operating manager of Northwest

Airways; and P. L. Crichton, president of Northwest Air Reserves.

**T**HE city of Duluth has been granted an extension (from May 1 till June 1) of its option now held on the St. Louis County work farm airport site.

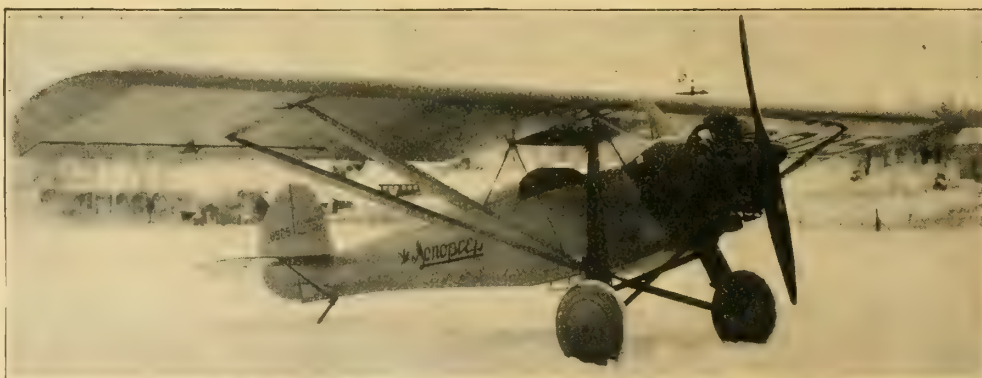
The city now has under consideration the purchase of this site, which contains 640 acres, for a municipal airport at a price of \$70,000, with \$10,000 payable on acceptance and \$20,000 a year until the entire amount is paid.

This site is located about five miles from the postoffice via improved roads.

**A**N air board was formed recently by the Duluth Chamber of Commerce. Members of the board are: Charles E. Foster, chairman; Otto Lachmund, George Fairley, R. L. Griggs, Sheldon Shepard, John Wilson, William C. Sargent, Matt Koneczny, D. A. Fitzpatrick, E. F. Wall, and George W. Welles, Jr.

**T**HE Mid-Plane Sales and Transit Company, operator of the Duluth-Minneapolis passenger airline and a division of the Universal Air Lines System, has discontinued the use of its Duluth airport located at Pike Lake, about fourteen miles away from Duluth. A portable hangar and two planes have been removed to Minneapolis. This company has also discontinued its Duluth office, but upon resumption of the Duluth-Minneapolis passenger service, is expected to open another office in Duluth in the spring.

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It will permit aviation training schools to charge less for instruction and still show longer profits.

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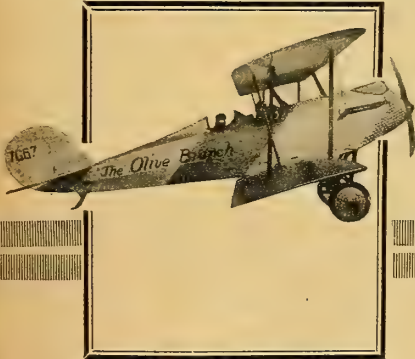
Our maintenance of unusually large New York stocks will now be supplemented by the unusual facilities of the RUSCO sales and distributing organization . . . insuring careful attention and prompt delivery for the largest as well as the smallest order from the most remote point.

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This plane was designed, built and stress-analyzed by our students. Right now these same students are flying it on our field.

"Any phase of aeronautics—engineering, mechanics, flying, etc., is serious business. If you have the desire to learn, go about it in a serious manner. Declare your goal, make up your mind to work toward it, and allow nothing to deter you.

"May I assist you in choosing your school? Visit us at any time and see for yourself what we have to offer—the finest engine instruction room, drafting and engineering equipment, lecture facilities, courses of study and personnel.

"I will be glad of the opportunity to personally review your qualifications and to advise you regarding the best courses of study to follow."

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At the Aviation Engineering School, conveniently located in the heart of New York City, all branches of aviation are taught—seriously and thoroughly.

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Every instructor is an "ace" in his individual branch of the business and possesses the rare faculty of intelligently passing on to others that knowledge which his accumulative experiences have taught him.

Our instructors teach you, in our own planes, the type of flying which will fast prepare you for all Government licenses and attractive incomes.

REGARDING OUR ENGINE DEPARTMENT: No money nor time were spared in arranging and equipping our engine room—and we are very proud of it. In it we have installed a most complete line of modern radial and water-cooled power plants for the students to work on. Benches, lathes, jigs, tools, instruction manuals and everything essential to a comprehensive elementary and advanced mechanic's course will be found here.

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## GEORGIA AIR NEWS

By AL MAJOR

GEORGIA now boasts of thirty-five pilots of all classes, licensed by the Department of Commerce, out of the 4,690 pilots in the United States. Georgia also has made rapid progress in the matter of airports, having now twenty-one airports, and nineteen more airports are planned for the immediate future.

The cities and towns which now have landing fields, either permanent or temporary are: Albany, municipal; Americus, southern Air Corps field; Athens, Epps' Field, municipal; Atlanta, Candler Field, municipal; Augusta, Daniel Field, municipal; Brunswick, commercial; Douglas, municipal; Fort Benning, Columbus auxiliary army field; Jefferson, intermediate; Lawrenceville, intermediate; Macon, Miller Airport, municipal; Macon, Central City Park Race Track, auxiliary; Madison, emergency; Pelham, commercial; Rome, emergency; Rome, municipal; Royston, intermediate; Savannah, Daffin Park, municipal; Tifton, emergency; Valdosta, intermediate.

The following cities and towns have either new airports or are enlarging their present airports; Americus, Athens, Columbus, Cordele, Dalton, Fitzgerald, Gainesville, Griffin, LaGrange, Louisville, Moultrie, Pelham, Quitman, Rome, Savannah, Thomasville, Valdosta, and Waycross.

ATLANTA is to be the hub or distributing center for the air mail routes to Cuba, Porto Rico, and South American points. Here the air mail lines from the east and from the middle west will converge. Atlanta will also be connected with Mexico and South American countries by way of New Orleans, Houston and Laredo, Texas, where the Mexican Air Mail System meets our own at the border.

Following are the air mail poundage figures for the two months of operation of each of the lines out of Atlanta: Atlanta-New York, 763 miles, operated by Pitcairn Aviation, Inc., November, 16,688; December, 20,906. Atlanta-New Orleans, 883 miles, St. Tammany Gulf Coast Air Lines, Inc., contractors, November, 3,096; December, 4,352. Atlanta-Miami, 622 miles, Pitcairn Aviation, Inc., contractors (not in operation in November), December, 5,841; Atlanta-Chicago, 785 miles, Interstate Air Lines, Inc., contractors, November, 1,076; December, 7,779.

FLYING over the Atlanta-Jacksonville air mail route on the northbound trips will be placed on night schedule on or shortly after February 14th, according to James G. Ray, operations manager, Pitcairn Aviation, Inc., holder of that contract. The beacons are nearly ready for operation, and as soon as they have been tested, the night service will be started. Under the new schedule, northbound planes will leave Jacksonville at 5 p.m., and arrive in Atlanta before 7 p.m., making connection with the New York plane which leaves at 7:15. Simultaneously, with the opening of the night flying schedule, a feeder line will be placed in operation from Jacksonville to Daytona and Tampa.

## OKLAHOMA AIR NEWS

Oklahoma State's 1929 Air Program

AN ambitious 1929 program was drafted at the statewide conference of aviation interests at Lawton recently.

The principal objectives of the 1929 program are: Preparation and advocacy of a legislative measure putting into effect in Oklahoma the Department of Commerce regulations governing the licensing of planes and pilots and the operation of airports; preparation and advocacy of an act returning gasoline taxes on aviation fuel to the benefit of the industry; continuation of the 1928 program of airport development; a statewide campaign for the marking of airports, cities and towns for purpose of identification; continued effort to encourage use of the air mail and express services; continued encouragement of the teaching of aviation subjects in schools and colleges, and of the development of more and better schools for instruction in flying.

Will Rogers, most air-minded of Oklahomans, was named honorary chairman of the "Mark Your Town" committee. Because of the heavy program outlined for the next year, the state chamber's aviation section will function through several committees instead of as a single committee. The committee appointments are:

*Mark-Your-Town:* Will Rogers, honorary chairman; W. A. Kitchen, Oklahoma City, chairman; Billy Parker, Bartlesville; J. Frank Matchett, Tulsa; C. F. Gilchrist, Tulsa; Harold Foster, Okmulgee; W. S. Symonds, Bristow.

*Legislation:* H. C. Martin, Oklahoma City, chairman; R. B. Quick, U. S. Department of Commerce; C. C. Herndon, Tulsa; C. H. Terwilliger, Tulsa; W. C. Fidler, Oklahoma City; Alex Singletary, Oklahoma City; J. Frank Matchett, Tulsa; Owen Black, Lawton; Maj. L. H. Brereton, Post Field.

*1929 Air Tour:* W. S. Collier, Tulsa, chairman; H. C. Martin, Oklahoma City; B. S. Graham, Oklahoma City; Paul Braniff, Oklahoma City; D. A. McIntyre, Tulsa; Bob Tarbuton, Oklahoma City; Glenn Condon, Tulsa; H. C. Mulroy, Ponca City; Willis Brown, Tulsa; Erle P. Halliburton, Duncan; Billy Parker, Bartlesville; R. B. Quick, U. S. Department of Commerce; Sam Coffman, Oklahoma City; Cloyd Clevenger, Tulsa; Burrill Tibbs, Oklahoma City; E. C. Rockwood, U. S. Air Mail Service.

*Airport Development:* R. F. Garland, Tulsa, chairman; Joe Reed, Lawton; Billy Parker, Bartlesville; R. B. Quick, U. S. Department of Commerce; W. H. McHenry, Oklahoma City.

## ARKANSAS AIR NEWS

By CARL OLSSON

COMMAND-AIRE, INC., has organized a flying school with three courses leading to solo, private license and limited commercial license training. Capt. Wright Vermilya, chief pilot, will head the instructors. John B. Bell, Jr., and Lieut. James Youngblood will be instructors.

Major J. Carroll Cone, whose term as auditor of the state of Arkansas expired January 15, became general sales manager for the company at that time. He has been assisting in sales work while continuing his duties as state auditor.

FOR the first time since the war, all units of the Arkansas National Guard will be brought together when the annual encampment is held in August. The encampment will be held at Camp Pike, seven miles northwest of Little Rock. The 206th Coast Artillery will be in camp from August 4 to 18 and will be followed by the 154th Observation Squadron, 216th Field Hospital and 216th Ambulance Train from August 11 to 25. The 153rd Infantry will train from August 18 to September 1. The artillery regiment has gone to Fort Sill, Okla., until this year.

## WEST VIRGINIA NEWS

THE Pocahontas Air Transport Company has been organized at Bluefield to serve the coal fields in the Pocahontas district. With a flying field 5 minutes from town, the company will engage in the sale of planes, flying instruction and air transport operation.

The officers of the company are: C. W. Freeman, president; Col. James E. Jones, vice president; W. E. E. Keopler, secretary-treasurer; and R. M. Baldwin, Jr., general manager.

## NORTH DAKOTA NEWS

By A. E. RIGGLE

THE Midplane Sales and Transit Company, although having closed its regular line between Fargo and Minneapolis for the winter, still furnishes service by sending a plane from Minneapolis to pick up anyone who desires to make the trip. Plans for extension are being made for spring.

HUNTING coyotes by airplane has proved a profitable business to George Albrecht and William Fisher, McLean county men. Early in December they appeared with 20 pelts, on which they were paid bounty by the county and which they sold to fur dealers.

A ONE-PLANE steel hangar has been erected on the Williston flying field, the Commercial Club being in charge of equipping the field. The hangar is leased by E. M. Canfield, Fargo aviator, who is operating in Williston.

PLANS for a flying school and landing field at Bowman, in the southwestern part of the state, are being pushed by Richard Fieldhouse and R. L. Fisher, Buffalo Springs, S. D.

TWO planes have been added to the equipment of the aviation department of the North Dakota School of Science, located at Wahpeton.

Arthur E. Sampson is pilot and instructor in the school.

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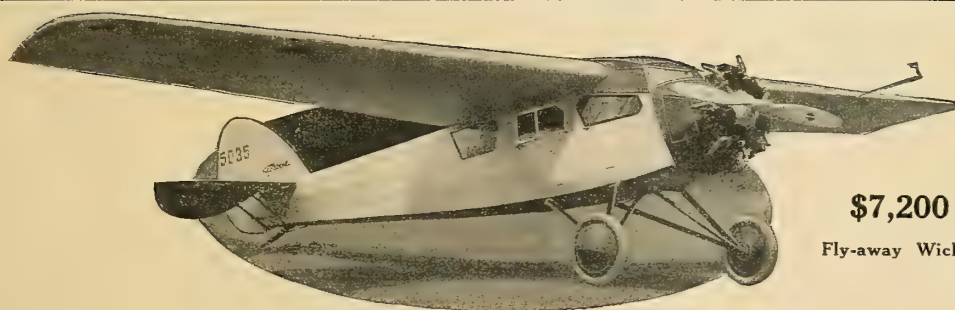
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## COLLIER TROPHY TO DEPT. OF COMMERCE

1928 Collier Trophy to Aeronautics Branch, Department of Commerce

THE Collier Trophy for the year 1928 has been awarded to the Aeronautics Branch, Department of Commerce, for its outstanding achievement in the development of commercial aviation in America, in 1928. The trophy is awarded annually to the person or organization whose outstanding contribution to aeronautics has been demonstrated over the period of a year.

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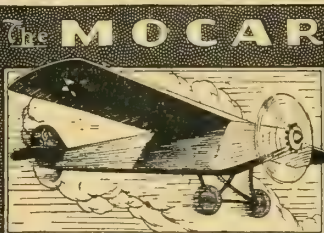
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## 1928 UNITED STATES AVIATION REPORTS

Edited by Arnold W. Knauth, Henry G. Hotchkiss and Emory H. Niles

REVIEWED BY JOHN DWIGHT SULLIVAN

AS the foreword of this volume states, the United States Aviation Reports 1928 "is designed to be a complete source book upon the law of aviation as it has developed in the United States up to the latter part of the year 1928." In one volume, the editors have compiled the Federal and State statutes, regulations, commercial forms, and more than one hundred fifty cases decided in the Federal and State courts. The editors have amply achieved their purpose and have presented to the legal profession and the aircraft industry the first authoritative classification of the law of aviation.

The book is excellently indexed by jurisdictions and subjects, with a digest of the law, so that the searcher for the law, who has heretofore been compelled to examine a maze of reports indexed in a pre-aviation era, can readily find every statute, regulation, opinion and decision of importance.

The editors have done a valuable work at a time when the need for such a volume has become apparent, and they are to be commended highly for it and for their intention of supplementing this volume as the courts and legislatures change or add to the law.

## AVIATION LAW

By Henry G. Hotchkiss

REVIEWED BY JOHN DWIGHT SULLIVAN

IN his volume, Aviation Law, Mr. Henry G. Hotchkiss has traced the development of Aviation Law in this country from its earliest sources to the present date, pointing out its origins and its relation to international law, the law of common carriers, maritime law and insurance law, citing the authorities and controlling decisions.

The work bespeaks the author's knowledge of present-day practice and of problems of the aircraft industry. Throughout the work, there is apparent his desire that the law of aviation may be developed in accordance with the experience of the sounder companies, providing certainty where none now exists, rather than restricting a growing industry.

Of especial interest are the chapters dealing with the tort liability of owners and operators and the need of some definition of liability upon which a sound insurance can be based. This work, important for its statement and interpretation of what the law is, is perhaps of even greater value in pointing out its paucity and the need for the enactment of helpful statutory law. Primarily of interest to lawyers and the aircraft industry, this book may well be recommended to legislatures, who will find in it both a review of aviation law to date and a helpful guide for the future.

## AIRWAY BEACON ON AIR MAIL STAMP

APPEARANCE of the new five-cent air mail stamp has occasioned much comment among purchasers.

Numerous queries have come to the Post Office Department.

The authorities say the design on the new stamp represents the highest airway beacon in the world. It is situated on top of Sherman Hill, 30 miles west of Cheyenne, Wyo., on the Boeing Air Transport San Francisco to Chicago route. The beacon stands 10,000 feet above sea level.

These airway beacons have been supplied the Government by the International Derrick & Equipment Company, and are manufactured in their plants at Columbus, Ohio, and Torrance, Calif.

In addition to airway beacon towers, IDECO is manufacturing for the aviation industry radio direction towers, landing light supports, floodlight towers, mooring masts, steel hangars, and standardized steel airport buildings.

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NEW ENGLAND NEWS

By GEORGE W. HAMBLIN

THE Curtiss Flying Service of New England, Inc., has purchased the Boston Airport Corp. This same company has also taken over the holdings of the New England Aircraft Corp. at Whittall Field, Worcester.

Lieut. Ralph C. (Kiddy) Barrows has sold out his shares in the New England Aircraft Corp. at Hartford to Kester S. Lindsay, formerly with the National Air Pageant Association.

THE Worcester Flying Club, which boasted two Waco-10s, has engaged Lieut. MacWilliams to do its flying, which will be purely club flying, for the winter months. Freddy Desjardins, who was chief pilot, has gone back into the automobile business until the spring, when he will start flying at his own field in North Grafton. George Haven is flying at Whittall Field with his own ship, the club having decided to stick to club flying instead of going into commercial work.

WITH the lease and hangar sites all lined up, the City of Boston has signed leases from the following companies: Boston Airport Corp., Colonial Air Transport, and Skyways. The plots are 220 by 105 feet, and the leases are for ten years at \$1,000 per year. There is a renewal clause for another ten years at an increase of not more than fifty per cent. So, beginning right soon, Boston will see three modern hangars going up over on the mudflats of Jefferies Point.

Springfield Notes

By Henry P. Lewis

FROST and snow have halted grading of the Springfield-Agawam Airport. Preparation of the huge tract of land situated four miles from the center of Springfield, which is to be ready for use in the late spring, has been under way since September. The airport is being developed as a private project by a corporation headed by Congressman Henry L. Bowles, with several prominent citizens of the city as officers.

THE longest non-stop flight from this city to a remote point was made recently when a Ryan Brougham, owned by the Massachusetts Airways, Inc., and piloted by John Rogerson, flew from the company's airport at Agawam to Brunswick, Ga. A second flight from Brunswick to Hollywood, Fla., completed the trip to the company's winter headquarters. An Eaglerock, also the property of the local company, had previously made the trip in short jumps.

AN advanced course in aeronautics under the direction of Professors W. B. Brown and B. S. Kelsey of Massachusetts Institute of Technology, has been launched by the State Department of University Extension. This course supplements a shorter course in elementary aeronautics. A full enrollment of 30 pupils is reported.

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# FOREIGN NEWS IN BRIEF

Compiled from reports from AERO DIGEST'S correspondents, the Automotive Division and the Transportation Division, Bureau of Foreign and Domestic Commerce

## GERMANY

### Aviation News from Germany

By Dr. Carl Hanns Pollog

ON October 1st, 1928, a combined sea-air service was inaugurated between Germany and Persia. Goods arriving at the Persian port of Bushire on board the ships of the German steam packet company *Hansa*, Bremen, will be forwarded by plane to any of the following places: Shiras, Isphahan, Teheran, Hamadan, Kermanshah, Kasr-i-Shirin, Pahlevi, and Meshhed. Through freight from Persia to Germany is accepted at the offices of the Junkers aviation company in Persia, too.

### Deutsche Luft Hansa Winter Service

THE Deutsche Luft Hansa inaugurated its winter schedule this year on October 15. According to the number of hours of daylight available, the winter flying season is divided into three sections—namely, a transitional period from November 4, 1928, to February 3, 1929, and another transitional period from February 4, 1929, to the resumption of the 1929 summer schedule.

This arrangement permits the international routes, not as yet lighted for night flying, to be covered in one day during the transitional periods, whereas in mid-winter, owing to insufficient daylight, they will be covered in two stages. However, the lighting of the route Berlin-Hanover will make possible one-day flights between Berlin and London, and the Berlin-Paris route also will be covered in one day.

Other important lines which will have all-winter service are: Copenhagen-Hamburg-Amsterdam, Berlin-Munich, Hamburg-Stuttgart, Berlin-Breslau-Gleiwitz, Berlin-Danzig-Koenigsberg, the latter route also being lighted for night flying. The Deutsche Luft Hansa planes are all heated for winter flying.

PHOTOGRAMMETRIE, Ltd., of Munich, Germany, has developed a new process of aerial photography which makes normal triangulation work on the ground unnecessary. The new process, which is called photography, merely requires the mensuration of a single strip of ground, upon which the

development of the trigonometrical calculations is based. These calculations are done in the office and not on the ground as hitherto. This apparatus takes 225 square miles of territory at one exposure. The camera simultaneously takes nine photographs of the ground and flashes them onto a single film. At a height of three miles, it reproduces on a scale of about 1:25,000. Enormous savings are expected by the use of this device.

## CZECHOSLOVAKIA

WHEN, on October 5, 1928, Major A. Vicherek of the Czechoslovakian Air Force established a world's record for straight line distance for light planes, he flew in an Avia B. H. 11 touring plane designed by Benes and Hajn. The plane was powered with a 5-cylinder radial air-cooled Walter engine of 60 horsepower.

Taking off from Prague, Major Vicherek flew to a point near Bednodemjanovsk in Russia, having covered a distance of 2500 kilometers in 15 hours and 20 minutes. This record was verified by the F.A.I. on December 11, 1928.

The general dimensions and weights of the plane are as follows:

Span .....	33.2 feet
Length .....	21.7 feet
Height .....	8 feet
Wing area .....	146.5 square feet
Power loading .....	29.9 pounds
Wing loading .....	130.6 pounds
Weight empty .....	763 pounds
Useful load .....	1,034 pounds
Gross weight loaded .....	1,797 pounds

## FINLAND

THE Finnish aviation company, Aero O. Y., of Helsingfors, completed five years of successful operation on December 31st, 1928. The principal route flown by this company (the only one in the country) is from Helsingfors over the Baltic Sea to Stockholm, which is operated jointly with the Swedish company, A. B. Aerotransport. The Aero O. Y. uses Junkers ships (F.13 and G.24) and Junkers engines. Its statistics show that 370,000 miles have been flown, 18,000 passengers and more than 220,000 pounds of freight and mail carried.

## HOLLAND

### K.L.M. Traffic Statistics

By Gerard E. Bakker

TRAFFIC statistics of K. L. M. (Royal Dutch Air Lines) over the past year again show a substantial advance over the former year. Commendable increases were made in freight transport, 71%; and passenger carrying, 33%. On regular services, 17,165 passengers have been carried, in addition to 1,513,885 pounds of freight; 77,220 pounds of mail and 51,115 pounds of parcel post. Moreover, 17,170 persons have been taken on pleasure flights at the various Dutch airports, and 280,000 miles have been flown on taxi work.

## SWITZERLAND

### Swiss 1928 Summer Season Statistics

DURING the past summer season, which began April 23rd and ended October 13th, 15,046 passengers, compared with 10,823 in the former season, were carried to and from Swiss centers by 14 international services, operated jointly by Swiss, German, Dutch, French, English or Austrian companies. Mails carried totalled 182,500 pounds and freight carried 650,270 pounds, against 102,280 pounds and 235,290 pounds respectively in the former season.

## SPAIN

A MINATURE airport will be featured as a part of the exhibit of the United States Government at the International Exposition, which opens at Seville, March 1st. This display will represent a complete modern airport with runways, an administration building with an open air waiting room, watch tower, etc., ten scale model airplanes, and hangars (on a mural painting as a background). Among the model planes in the exhibit will be a miniature of the *Spirit of St. Louis*, a Ford trimotor, and a Stearman biplane.

The exhibit is being prepared by the Aeronautics Branch of the Department of Commerce under the direction of Capt. Sidney Morgan. Martin Jenter is director of exhibits for the United States Commission to the Seville Exposition.

## ITALY

THE Società Avio Linee Italiane has suspended service on its Milano Trento-Monaco line until February 28, 1929. The Milano-Trento and Milano-Rome service, however, will continue through the winter. Planes leave Milano at 8:50 for Trento and return at 10:30. Planes for Rome leave at 12, and leave Rome at 12:30 for Milano.

Up till November 15, 1928, A. L. I. planes had made a total of 421 flights, and had carried 1,114 passengers, 14,505 pounds of baggage, 4,284 pounds of merchandise and 77 pounds of mail.



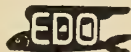
The Avia BH 11 light plane, which established a world's distance record

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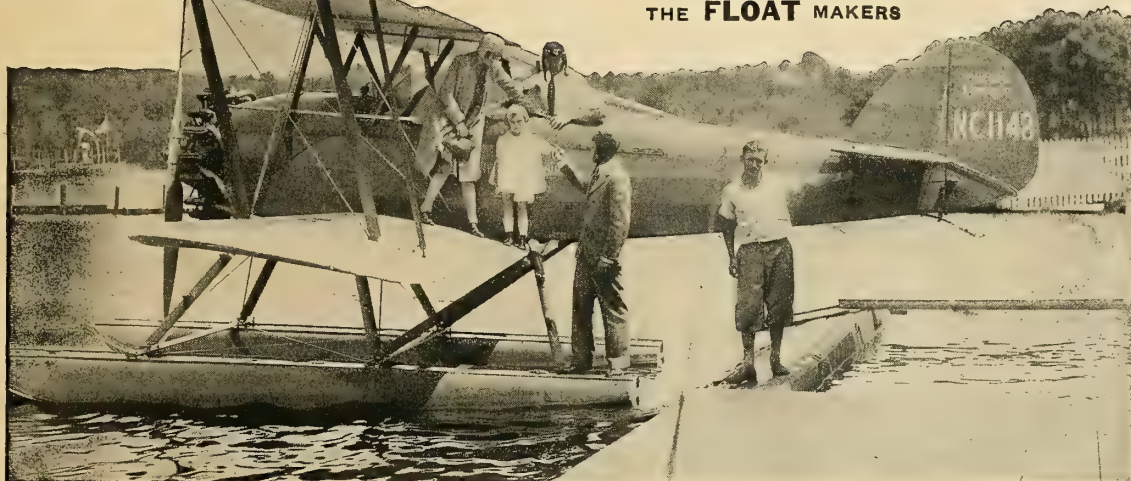
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## CANADA

## Canadian Air News

By James Montagnes

ON January 28th, a new air mail route was started between Ottawa, Montreal, St. John, and Halifax. The schedule calls for mail which is taken from the transcontinental eastbound trains passing through Ottawa, to leave the capital at 6 a. m. for Montreal. There it will be added to the train mail from Toronto, which arrives at 6:55 a. m., about the same time as the air mail will arrive from Ottawa. At Montreal, a plane will take the mail to St. John, arriving there at noon, following which the plane leaves for Halifax with the remainder of the mail.

AN additional 50-acre plot has been purchased at Toronto by the De Havilland Aircraft of Canada, Ltd. The new site adjoins the 20 acres formerly held by the company, and provides a frontage of 2,100 feet.

## Montreal Air News

By C. P. C. Downman

CANADIAN aviation moved forward at a rapid pace during 1928. On January 1, 1929, there were 333 airplanes in operation, or more than three times the total of 101 on the same date a year ago. Of the total, 246 are engaged in commercial pursuits, and 87 are being used in government services.

The increase in the number of aircraft has brought about a corresponding development in flying facilities. There are at present 44 air harbors in Canada as compared with 25 on the same date last year.

Licenses held by commercial pilots at the first of the year numbered 190, or more than four times the figure of 40 on the comparative date.

There are 55 commercial aviation companies in Canada. This is more than twice the number in operation a year ago. Besides the commercial concerns, there are 15 private owners and 16 flying clubs.

THE Department of National Defence is purchasing seventy new machines this spring for civil government operations. These include forestry patrol, weather observation duty and grain dusting. Several will also be used for training purposes.

PROMOTION of commercial aviation in Canada and the carriage of air mail will receive impetus from the Aviation Committee of the Canadian Chamber of Commerce, to which representatives of every province have now been appointed.

The committee members are: H. R. Stewart, of Charlottetown, P. E. I.; R. J. R. Nelson, general manager of the Halifax Shipyards, Ltd.; J. D. McKenna, president of the St. John *Telegraph-Journal*; Col. Bruce Payne, of Granby, Que.; Brig.-General C. H. Mitchell, chairman of the committee, of Toronto; D. B. McColl, manager of the Hydro Electric Commission, of Walkerville, Ont.; John Hunter, secretary of James Richardson & Sons, Winnipeg; G. C. Rooke, C. A., of Regina; A. H.

Weaver, manager of the Imperial Bank of Canada, Calgary; G. H. Cottrell, superintendent of the Canadian Pacific Railway in British Columbia, Vancouver.

THIRTY-FOUR De Havilland Moth light aeroplanes have been ordered by the Department of National Defence for re-equipping the Royal Canadian Air Force.

Twenty-eight of the planes will be fitted with wheels and sent to the Camp Borden flying station, where they are to replace the old Avro training machines now in service there. The remaining six Moths are seaplanes, which will be used to equip the government's flying station at Vancouver.

All these machines will be fitted with the Handley-Page automatic slots. They will be the latest model, that is with a metal fuselage, which has been especially evolved for Canadian flying conditions, and which recently passed all tests at Ottawa. They will be partially manufactured in England, but will be assembled and tested at the De Havilland company's plant at Mount Dennis.

## Vancouver Air News

By A. F. Roberts

GREAT claims are made for a helicopter which has been invented by John Hess, a former German citizen who is now a resident of New Westminster, B. C. He states that after years of experiment he has perfected plans for a machine which will ascend and descend vertically.

Lifting power for the machine, which has been tested in model only, is provided by two nine-foot duralumin propellers operating on vertical shafts. The blades of these propellers, which are set at an angle of fifteen degrees, rotate inwards. The trailing edges are down when the machine is stationary, horizontal when ascending, and elevated when descending. The last-named operation transforms the propellers into parachutes, it is claimed.

A stabilizing fin between the propellers prevents sideslips, it is said. A vertical speed of two miles a minute is claimed for the machine.

FLIGHT LIEUT. A. H. HULL, commanding officer of the Vancouver unit of the Royal Canadian Air Force, has been appointed exchange officer to the Royal Air Force. He will go to England in March and will be attached to the mother force for two years.

HARRY A. FARR, managing director of the Vancouver Airways, Ltd., has been appointed Canadian distributor for Irwin Meteorplanes. He will tour the prairies and eastern Canada to appoint representatives. Mr. Farr has been connected with the aircraft industry for nearly fifteen years, having made his first flight in San Francisco in 1912. He served overseas with the Royal Flying Corps and the Royal Air Force during the war.

PLANS to revive the Victoria-Vancouver-Seattle passenger, mail and express services have been completed by B. C. Air-

ways, Ltd., of Victoria, it is announced by J. E. Eve, president of the firm.

BRITISH aircraft may be manufactured in Victoria, it is indicated by Norma A. Yarrow, managing director of Yarrow, Ltd., who has returned from a visit to England, where he inspected leading airplane manufacturing plants. Mr. Yarrow, who is a son of Sir William Yarrow, famous shipbuilder of the Clyde, is himself a well known shipbuilder, and his plant at Victoria is well known on the Pacific Coast.

PAT RENAHAN, former R. A. F. wartime pilot, who has been with the Commercial Air Transport Co. of Everett for the past two years, has been appointed instructor of the Sprott-Shaw School of Aviation in Vancouver and has commenced operations with the school's new Waco-10 at the city's temporary airport on Lulu Island. Since 1921, Pat has been flying commercial planes in the United States.

THE Yukon Airways & Exploration Co.'s new Alexander Eaglerock has reached Atlin and started its winter air mail duties.

## Western Canada Air News

By C. D. McCabe

AN air mail service between Winnipeg, Regina, Calgary, Saskatoon and Edmonton was operated during the last two weeks in December to test its practicability. Western Canada Airways furnished three Fokker Super-Universals, one of which left Winnipeg each morning and the other two of which started from Calgary and Edmonton, all meeting at Regina. Here the mail was exchanged and the same planes returned to their home stations. Through mail was then placed on the trains and by this means made a saving of a full day in any transcontinental deliveries.

ARRANGEMENTS have been completed for air express and passenger service between Omaha and Winnipeg, via Watertown, South Dakota, and Fargo, North Dakota, and also between Minneapolis and St. Paul and Winnipeg. Capt. P. T. McCarty of the International Airways, Inc., of Seattle, concluded the negotiations with the Western Canada Airways of Winnipeg, which will handle the Canadian end. Boeing four-passenger planes will be used, and the service will begin with a tri-weekly schedule.

THE activities of the Winnipeg Flying Club continue to grow in importance and interest. The club began operation in the spring of 1928 with but one DH Moth. Subsequently, however, another Moth and an Avro Avian have been added to the flying equipment.

Of the forty members of the club who are flying solo, only twelve had training previous to joining this organization. Twenty-seven members possess private and commercial pilot's licenses.

J. A. Sully is president of the club; H. P. Crabb, vice president; F. D. Bradbrooke, recorder; and Michael de Blicquy, instructor.

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## FRANCE

## Notes from France

By Paul E. Lamarche, Jr.

**FIGURES** for the French budget for 1929 have just been given out. Since this is the first year in which French aviation will be under the administration of an Air Minister instead of being controlled by the heads of four different departments, the progress of French aeronautics should prove interesting to follow.

The total credits requested for 1929 amount to 1,838,000,000 francs, which is 600,000 francs less than the total credits requested by the four different ministers who handled French aviation last year. Having all French flying under one head will bring about many advantages,—notably, the avoidance of duplication of effort which in the past has served to increase expenses and which this year is expected to bring about a saving of 50,000,000 francs on installations and another like sum on materials. This saving will enable the diverting of more money towards research work, testing and the construction of prototypes for technical studies.

The corresponding credit amounted to 40,000,000 francs in 1928, while the last budget prepared by M. Bokanowski amounted to 65,000,000 francs. The present budget calls for an increase to 130,000,000 francs, which gives a good idea of the size of the effort which is to be expended in that line. Under this heading there is an increase of 5,000,000 francs for record prize money and the organization of technical tests and competitions. Another increase of 11,000,000 francs is destined for the subsidizing of technical and scientific research work. The remaining part of this appropriation will be used in buying planes, flying boats and motors.

The credits that are used for the maintenance of machine shops and the tools and other equipment formerly were 4,500,000 francs and are now increased to 10,000,000 in order to start the operation of a new policy in France. This new idea consists of the scattering of a number of air plants in many parts of the country with complete stocks of various equipments rather than having a number of planes in service. With this idea the immediate construction of planes for military purposes could be started in any part of the country in an emergency. It seems a good idea inasmuch as a great many planes used for such purposes naturally deteriorate and thus create a greater overhead. The technical staff, the number of engineers, and such, will likewise be increased to cope with this situation and will be able to be shifted from air center to air center, as well as to foreign countries. Most of the technicians come from various army training quarters, but now a sum of 3,500,000 francs is being appropriated for the creation of the *Ecole Nationale de l'Application de l'Aeronautique*, or technical air school.

The appropriation covering propaganda, exhibitions and international competitions amounts to 2,745,000 francs, which represents an increase of 1,360,000 francs. The commercial air companies will receive the

benefits of subsidies amounting to 172,500,000 francs, which is an increase of 169,500,000 francs. Monsieur Laurent Eynac, the Air Minister, has already pointed out to the Commission of Finance that he is considering a complete reorganization of the systems of these companies on the long contract basis, which is likely to be subject to revision every five years and which is to be submitted to the French parliament.

**A** SUM amounting to 20,000,000 francs is to be appropriated for the building of a great marine airport at Quatre-Canaux, near Montpellier in the south of France.

**AS** in America, the railroads in France are becoming more and more interested in the development of commercial aviation. The French State Railroads are now lending their support to a new company which has been formed for the exploitation of new airlines in the interior of France. This company, which is known as the *Societe pour le Developpement de l'Aviation Commercial Francaise*, will inaugurate an airline between Bordeaux and Clermont-Ferrand next May and will eventually continue this route to Lyon, whence air connections can be made to Paris or Marseilles in France or to Geneva in Switzerland. Their original capital, with which they were organized, was 1,600,000 francs, which has since been increased to 1,900,000 francs. Small trimotor planes will be used over their air routes. Several are at present in the course of construction in the factories of the *Societe Nieuport-Astra* and the *Societe Provencale de Constructions Aeronautiques*.

**THE** Aero Club of the town of Mans is raising a monument in the town in honor of Wilbur Wright. It was in Mans that Wilbur Wright made some of his first flights in Europe, and recognition is thus being made there of the twenty-fifth anniversary of his first flight in America.

## ENGLAND

## Notes from England

By E. HAWTHORNE

**THE** British Air Ministry has recently announced that during the New Year, in addition to the attempts on the non-stop and duration records with the new Fairey-Napier monoplane now stationed at Cranwell Airdrome, a specially constructed all-metal machine with a supercharged motor will be used for an attack on the present altitude record.

## Schneider Trophy Entries

**ENTRIES** for the Schneider Trophy contest closed January 1st and resulted in entries being received from Italy, France and the United States. The American challenge was received just in time, for it arrived in the form of a cable a few minutes before midnight on December 31st.

The entries for the race, which will be flown over the Solent, Southampton, in late August or early September, now number ten. Italy, France and Great Britain will each have three machines, and the United States one entry.

## Australia-England Flight

**CAPTAIN FRANK HURLEY**, who was with the Mawson Antarctic Expedition and the Sir Ernest Shackleton venture to the South Pole, has arrived in London after an unsuccessful attempt to lower the record from Australia to England.

He came down at Athens, Greece, and was unable to continue owing to the machine being so badly damaged as the result of landing in a bog and overturning. Captain Hurley was accompanied on the trip by Flying Officer Moirt and Flying Officer Owen.

## MEXICO

**BELOW** is the schedule which is employed on the air mail and passenger run from Tampico to Mexico City. The contract for this route is held by the *Compania Mexicana de Aviacion* of Tampico. Geo. L. Rühl is president of the company. The flying equipment used is made up of Fairchild cabin monoplanes. Five planes of this type are being used on this route and the Merida-Vera Cruz run, also under contract with the Mexican Government by the *Compania Mexicana de Aviacion*, an associate company of the Fairchild Aerial Surveys, Inc., of New York City.

Read Down	Daily	Read Up
6:30 a. m. Lv.	Tampico	Ar. 2:30 p. m.
7:15 a. m. Ar.	Tuxpan	Lv. 1:35 p. m.
7:20 a. m. Lv.	Tuxpan	Ar. 1:30 p. m.
9:30 a. m. Ar.	Mexico City	Lv. 11:30 a. m.

On the Vera Cruz-Merida route a tri-weekly service is operated, planes leaving Merida each Monday, Wednesday and Friday, and returning each Tuesday, Thursday and Saturday, there being no service on Sunday. Since there is no landing field at Vera Cruz, the mail planes land and take off from the *Compania Mexicana de Aviacion's* own field located at Tejeria, V. C., which is about 10 miles distant from the City of Vera Cruz. The schedule is as follows:

Read Down		Read Up
7:00 a. m. Lv.	Merida	Ar. 2:55 p. m.
8:10 a. m. Ar.	Campeche	Lv. 1:50 p. m.
8:25 a. m. Lv.	Campeche	Ar. 1:40 p. m.
9:45 a. m. Ar. C.	del Carmen	Lv. 12:25 p. m.
9:55 a. m. Lv. C.	del Carmen	Ar. 12:15 p. m.
10:45 a. m. Ar.	Villahermosa	Lv. 11:15 a. m.
11:00 a. m. Lv.	Villahermosa	Ar. 11:05 a. m.
12:00 Noon Ar.	Minatitlan	Lv. 9:55 a. m.
12:10 p. m. Lv.	Minatitlan	Ar. 9:45 a. m.
1:40 pm Ar.	Tejeria (Vera Cruz)	Lv. 8:15 am

## CHINA

**WITH** Hankow as its main terminal point, the Commercial Aviation Company, Ltd., has been organized in China for the purpose of operating aerial transport lines between the principal cities of that country. According to present plans, these routes will connect Hankow with Peking in the north, Canton in the south, Shanghai in the east, and Chengtu in the west.

This airline was first proposed by the Wu Han Commercial Aviation Association, and was sponsored by the Provincial government and local organizations.



# LE BOURGET—DUGNY AIRPORT

**L**E BOURGET - DUGNY Airport, which is under control of the Service of Air Transport (Department of Commerce and Industry), is located seven and a half miles northeast of Paris (Cathedral of Notre Dame). It is three and a half miles beyond the fortifications and a quarter of a mile northeast of Bourget. It is accessible by National Highway No. 2 from Paris to Maubeuge.

Having passed through the entrance to the airport, one sees an important building called "Paul Bert Pavillion," so called in memory of a great French physiologist. In this building, periodic medical examinations of pilots, mechanics and air navigators take place. In fact, every six months all pilots, mechanics, and navigators are examined and pronounced "suited," or "unsuited." In case of unsuitability the pilot's license is suspended. The examination comprises: (a) general medical and surgical examination; (b) an examination of eyes to determine their acuteness of sight, ocular mobility, field of vision and color perception; (c) an examination of the ears to determine hearing acuteness, condition of the middle ear and sensitivity; (d) an examination of the nose and throat; (e) measurements of the rapidity and regularity of auditory, tactile and ocular psycho-motor reactions. Each examination is made by a medical specialist, in a separate section equipped with most precise apparatus.

In addition to laboratories there are, in this building, an apothecary and a lounge room. Under the ground level is installed a pneumatic chamber in which the air pressure and temperature can be varied to simulate the conditions at high altitudes. This altitude chamber is used not only to examine pilots, but to regulate and adjust oxygen installation for altitude flights. The size of the chamber is such as to permit the testing of various instruments used in aeronautics.

Further, on each side of the road joining the airport with the national highway, offices of air transport companies and the agency of the "Veritas" Bureau are located. The latter is charged with technical supervision of airplanes, and its services in aeronautics are analogous to those it renders to the merchant marine. It is also a technical consultant for the insurance companies.

At the end of the road and on the border of the field are located buildings housing the executive offices, customs office, restaurant, and meteorological station. The meteorological station furnishes the pilots with weather reports and forecasts useful for their flights. It also informs the pilot in flight, by means of radio, of important changes in weather.

The commander of the airport is in touch by means of telephone, telegraph and radio, with various French and foreign airports. Radio is the most important means of communication for the safety and regularity of the air transport. As soon as an airplane

takes off, it signals the airport towards which it is destined, which in turn communicates with the airport of departure until the plane arrives. Throughout the flight, the plane is in constant communication with various airports by means of its radio. Near the executive offices there is a bulletin board on which are posted time tables and information regarding the progress of various planes.

Passengers arriving from Paris by automobiles belonging to the air transport companies, after a short wait in the waiting room, while their baggage is being registered, go through the customs office and the office for visé of passports to the embarkment area.

Each airplane is inspected before departure by the controller of the Service of Air Transport, who verifies the papers and gives the pilot permission to leave. The plane then taxis into a favorable position and takes off.

On arriving, having landed, every plane taxis to the area of embarkment, where it is awaited by the customs officials and the controller of the Service of Air Transport. The passengers and baggage are unloaded, passing through the customs office, while the plane is taxied into the hangar.

The group of buildings described here, with the dormitories of the personnel, constitutes the "heart" of the airport, while on the sides extend the hangars and shops.

The six hangars on the south are metal and of standard construction. Each measures 105 by 138 feet. The height of the doors is about 28 feet. The five north hangars are of reinforced concrete, each measuring 164 by 118 feet, with doors 49 feet high. All the hangars include offices of the respective operating companies. Behind these hangars, there are others of smaller dimensions which are used by operating companies as store rooms and repair shops.

In an airport such as Le Bourget, the installations belong to the state, which leases them to various airlines. Each com-

pany occupies, according to its importance, one or two hangars. The hangars are heated by hot air in the winter and have electric lighting systems and electric cranes.

The wind direction, which governs the sense of take-offs and landings, is indicated by a movable tee and by air cones. At night the tee is illuminated.

The boundary of the airport is indicated by white and red boundary marks, illuminated at night. A large circle, 164 feet in diameter, marks the center of the field. At night red electric lights indicate the hangars and all elevated obstacles.

Two aerial beacons, one of which is visible at a distance of about 60 miles, facilitate night arrivals at Le Bourget. Landings at night are made with the aid of powerful projectors which illuminate a considerable area of the field. The movement of planes on the field is subject to strict regulations, which are directed from a special control tower.

The Airport of Le Bourget-Dugny is used by numerous French and foreign airlines. L'Air-Union handles the air travel between London, Paris, Lyon, Geneva, Marseilles. La Compagnie Internationale de Navigation Aerienne operates the line from Paris to Strasbourg, Nuremberg, Prague, Varsow, Vienna, Budapest, Belgrade, Bucharest and Constantinople. The airplanes of the Ligne Aerienne Farman fly from Paris to Cologne, Essen, Berlin, and also to Brussels, Rotterdam and Amsterdam. The Compagnie Generale Aeropostale operates the service from Paris to Bordeaux and Biarritz. The English Imperial Airways planes, the Compagnie Royale Neelandasse, and Deutsche Lufthansa fly between Paris and the capitals of neighboring nations.

The following are the operating statistics for Le Bourget for the years 1923-1927:

Year	Departures and arrivals of planes	Passengers	Cargo in pounds	Mail in pounds
1923....	6,742	14,341	302,500	1,026
1924....	8,178	17,556	441,000	1,185
1925....	9,764	23,932	500,000	1,720
1926....	8,755	27,851	506,000	3,865
1927....	12,744	38,081	381,000	5,690



The principal airport of Paris—Le Bourget-Dugny

P & A Photo



## AIR NAVIGATION MAPS

*(Continued from page 53)*

of use to the aviator. Features shown have been reduced to the minimum to avoid confusion and to make the maps as simple as possible. A standard set of symbols, colors and contour lines has been adopted by the Board of Surveys and Maps of the Federal Government, and is now being used in the production of aviation charts and maps by the Army, Navy and Department of Commerce. A standard scale of 1 to 500,000 and a uniform width of 10½ inches have also been adopted.

However, the government is always open to suggestions as to how the maps may be improved. Additional information will be shown on future maps if it is found of value, as well as any changes in present methods if necessary.

A recent change both in the Commerce and Air Corps maps is the omission of emergency landing fields that are not marked. It was found that those not marked are often not in a safe condition and merely add unnecessary confusion. Another problem which is now being given most careful consideration by those engaged in planning the maps is the course to be shown. Present maps indicate the best airline course between the terminal airports. Some fliers and officials of the Department of Commerce contend that the course on a lighted airway should follow the beacons exactly. Since the beacons are located on hills, buildings and other places where property can be obtained cheaply and the lights seen at a distance, they are seldom in anything approaching a straight line. The airline course is shown on present maps because the beacons can be observed from this course in all but the most foggy weather, and it was believed that a beacon to beacon course involved an unnecessary change of course especially for day flying. Experimental copies of the Cheyenne-Pueblo map with a beacon to beacon course are now being used by some fliers in an effort to settle the problem.

The present program calls for the publication of new maps as the lighted airways are established, but in practice it has been found very hard to keep to this schedule. The present act of Congress authorizes the completion of aviation maps of the entire country in 20 years. With the limited appropriations available the present rate of progress will mean that it will take nearly 100 years for their completion.

A development which would greatly speed the preparation of maps and add to their accuracy would be the extensive use of aerial photography. This would be of particular value in the western states where accurate base maps are not available. The Hydrographic Office of the Navy uses photographs taken from 10,000 feet to assist the surveying ships. These photographs have been of great value in plotting in the shore lines of almost inaccessible areas along the coast of Cuba, Venezuela and the Gulf of Panama, and have been of special benefit in the selection of locations for triangulation towers. Aerial photographs of lighthouses, seaplane anchorages, and land-plane fields are shown on the back of all Navy aviation charts. The Army has also done considerable experimental work of this character, and an occasional air photograph is used in compiling the Air Corps maps. At present, however, the Department of Commerce has no appropriation available for this work, but as photographic equipment becomes perfected, it is hoped by officials engaged in making the maps to make extensive use of photography in compiling aviation maps.

The Navy approaches the making of aviation charts from an entirely different angle than the Army and Department of Commerce. Its charts are primarily for the use of Navy seaplane pilots whose navigation problem is to keep the plane over water as much as possible. Much of the detailed information such as county roads shown on the Commerce and Air Corps maps is of little value to the seaplane aviator. On the other hand, information as to lighthouses, buoys, and seaplane anchorages is vital, so the difference of the navigation problem involved has resulted in a slightly different form for the Navy charts. Most of them are first issued as provisional charts pending flight checking as a basis for the collection of complete and accurate data. When all the main features have been completely checked, they are published in colors as standard charts.

The maps of the Air Corps and the aviation charts in the Navy, as well as the Department of Commerce Air Navigation maps, are all distributed through the Aeronautics Branch of the Department of Commerce at Washington. Ten Commerce maps are now avail-

able. Four cover the Dallas, Texas, to Moline, Illinois, airway through Oklahoma City, Wichita and Kansas City; one the St. Louis-Chicago route; one Chicago to Milwaukee; one Pueblo to Cheyenne and three the Atlanta, Ga., Washington, D. C., airway.

The entire program of the Air Corps constituting 52 maps are now available, the last three covering the St. Louis-Muskogee, St. Louis-Dayton and San Francisco-Yreka routes having been published in September.

Eighteen Navy aviation charts are also ready. They cover the seaplane routes between New York City and New Orleans; from Key West to Habana, Cuba; Cuba to Cape Haitien, Haiti; and from Habana down the east coast of Central America to the Panama Canal Zone. Three others covering the routes between San Diego, and San Luis, California; San Luis and San Francisco; and the outside chart between Astoria, Washington, and Vancouver, B. C., are now on the press and will be ready for distribution by February 15.

Present plans of the Hydrographic offices of the Navy Department call for the completion of two charts covering the route north of Vancouver, B. C., to Juneau, Alaska, and one between New Orleans and Galveston, Texas, within the next few months. The program also schedules the rest of the West Coast charts between San Francisco and Seattle for early publication.

The Commerce map of the route between Buffalo and Albany has been completed and flight checked and will be available about March 15. Others between Cincinnati and Cleveland, Cleveland and Buffalo, Cincinnati and Chicago, Milwaukee and Twin Cities, Birmingham and Atlanta, Los Angeles to Boise, through Las Vegas, Milford and Salt Lake City, and Albany to Montreal have been started and will be published as rapidly as the limited appropriation available and small personnel of the Department permit. It is probable that they will be published approximately in the order named, but the publication program of the Department of Commerce is very flexible, and the maps are first issued for the airways where there is the greatest demand and need for them. It is quite possible that other maps may be published ahead of those listed if there is a demand for them.

The Commerce and Air Corps maps sell for 35c each, and the Navy charts at 40c. In practically all cases they are shipped the day the Department of Commerce receives the order.

The problem of wide and quick distribution of the maps has received serious attention from the three departments engaged in the work. At the present time all the maps may be obtained from Washington with the exception of the Navy charts which are also distributed by the 24 branch hydrographic offices located in the principal cities. No agents have been appointed by the Department of Commerce or the Air Corps. The many changes, corrections and additions being made on the maps now would make it very hard for any agency to keep a complete supply of all the latest editions. For this reason officials in charge of the work believe that the interests of aviation can best be served at the present time by a central distributing agency. However, as the demand grows and the maps have become thoroughly standardized, it is believed that some sort of an agency distribution through the leading airports will be established.

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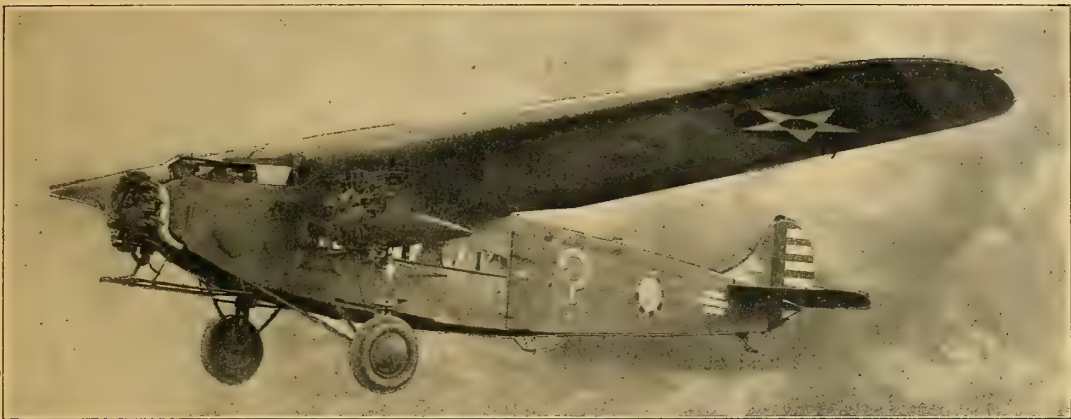
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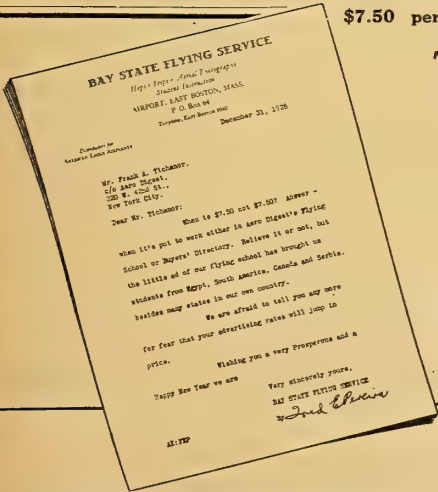
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### CY-ZING UP THE GNUS

*(Continued from page 56)*

air of social tone to an otherwise drab event. But the Socialists have succeeded in breaking the custom, as part of their attack on the system of capital punishment. It is thought that the lack of evening dress will remove some of the charm that heretofore has attended these functions. Just what the well-dressed executioner will wear now is a matter for conjecture, but it is surmised that a black sack suit with a quiet tie will be the vogue, while green sox or cream spats will be considered *déclassé*.

It is time, I humbly suggest, that we do something about the sartorial embellishments of our own executioners. When it is necessary for the Good of the Service—and the prejudices of some of the Higher Servitors—to court-martial some of our plain speaking generals and admirals, what should the executing court wear? In their naval or military uniforms the members of the court are merely officers, in no way distinguished from the poor wretch they are trying. There should be some way of setting them apart from the victim. I suggest, therefore, that when it is found needful and jolly to court-martial an officer for speaking his mind on airplanes or on Navy costs, that the court should be fittingly attired in black robes, with cowls that cover their heads and faces. A sort of Ku Klux regalia dipped in ink would serve well enough—it wouldn't have to be waterproof, for half the evidence in those cases won't wash, anyhow.

**T**HE Soviet Air League now has over three million supporting members and hopes to double that number in 1929. The aim of the League is to make Russia paramount in the air. At the present time all they lack are airplanes, pilots, mechanics, airplane factories, flying fields, gasoline, oil and money. An American pilot who flew over Russia told me that he looked down and thought he was flying over a brush-covered country, dense with bushy growths. It turned out to be only the Bolsheviks looking up at him.

Which reminds me that everyone else who hasn't been to Russia has given to the gasping world his impression of the Bolshevik experiment, so I may as well give mine. I get paid for what I write here, you know—odd though it may seem to you—and I'd just as lief write on one foolishness as I would on another. About Bolshevism—when I was a young man (this was about the time of the great Chicago fire—in fact, they never did decide whether it was me or Mrs. O'Leary's cow that knocked over the lantern, for we were both full that night) when I was young, I say, I used to work for a bank for \$35 a month. At that time I was a right-down anarchist. I was in favor of blowing up the bank, and especially the president, an old duck with whiskers and adenoids. I remained an anarchist until they raised me to \$50 a month, by which time I had saved up \$37 and had become a Socialist. I figured there was no way they could divide property so that I could possibly be a loser. Well, I plugged along until I became teller, handling the actual cash—and in no time I had my first thousand dollars. (This was before they had chartered accountants snooping around and being nasty about trifles like exchange.) Well, Sir, the day I reached that thousand I instantly became a Capitalist, and I've been one ever since.

And that's my comment on Bolshevism—my own personal experience. There's nothing *bad* about Bolshevism, despite what you hear about it. It's a pleasant enough

*(Continued on next page)*



EVERY pilot dreads soft, rain-soaked turf when making landings during or after rain-storms. He knows that the probability of accident then is many-fold greater. It is no wonder, therefore, that airports which have adequate drainage are better patronized and more profitable.

Adequate drainage of airports can only be obtained with drain pipe that has high initial capacity and also that permanently retains such capacity; and "Poros-wall" Rapid Drain Pipe meets these two requirements exactly.

It has ten times the drainage capacity of ordinary drain pipe because, as its name implies, its walls are porous and therefore drain throughout their entire area. Also, "Poroswall" is laid with solid joints which keep out clogging material, and insure exact alignment and better flow-lines.

Many prominent airports are today drained with "Poroswall."

*Send for Demonstrator - Section  
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**"A Foot of  
Drainage  
for Every  
Foot of  
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**Walker Cement Products, Inc.**  
Little Ferry, N. J.

Drainage  
Advice and  
Estimates  
Without Ob-  
ligation.

# WALKER POROSWALL RAPID DRAIN PIPE



# Ireland Flying Boats

## now nationally advertised

Wherever men or women fly and wherever sportsmen gather to discuss the new sport of travel by air, the Ireland Flying Boat will be a topic—and now, thousands of new devotees will be caught with the lure of our national advertising.



Yachtsmen, sportsmen, business men in a hurry—the new market for safe flying boats—will accept the Ireland because it is a real, true boat and a safe, dependable airplane.

The readers of *Spur*, the *Sportsman* and *Motor Boating* will see this Ireland advertising in February.

This brochure describes and illustrates the Ireland Flying Boat and gives specifications.



## CURTISS FLYING SERVICE

Incorporated

*Sole Agents in the United States*

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Manufactured by Ireland Aircraft, Inc.  
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# MODERN FLIGHT

STUDENT PILOTS and young men about to enter the game can cut down the number of hours usually necessary before soloing by a study of the greatest flying instruction book of the year, "Modern Flight".

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out of the wealth of his 10 years' flying experience, explains in simple, interesting language, every movement of the controls for take-offs, landings, straight flight and aerobatics.



**SAVES YOU \$50.**

*when you LEARN TO FLY*

The ambition of every flying student is to be able to handle a ship alone in the least time possible. Purchase of Clevenger's "Modern Flight" is a long step in that direction.

### HERE IS MY DOLLAR

Gentlemen:

Rush copy of Clevenger's complete flying course.

Name .....

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Manufacturers of the Eaglerock  
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(Continued from preceding page)

idealistic theory, except that it doesn't work very well. But it's stupid, which is worse than being bad. It takes no account of the enlightened selfishness of human nature, which is the one quality that has got any of us anywhere. Minus the determination to forge ahead, for my own personal benefit, I'd still be where I started, wrapping hams in a meat-packing plant when I was fourteen years of age—a poor, shabby child, lacking education, money, friends; lacking everything but hope and ambition. Heigh-ho! And I haven't got far yet—I'm still discontented. But in Soviet Russia—I fear I'd still be wrapping hams. Why bother if someone is going to come along and take the ham? That's the main trouble with Bolshevism.

I BLEAT mildly for a school for reporters who wish to write on aviation; one is needed urgently. One of these gentry tossed off the following item: "Run over and dragged a considerable distance by his airplane, which he cranked while it was in gear, Mr. Soandso is in the hospital with a broken arm." Another earnest scribe gave to an anxious world the following hot news on the *Bremen* last year: "The expert is to advise whether the *Bremen's* unique undercarriage is to be used. Irish airmen were surprised when they learned that this undercarriage, consisting of two wheels like motor bicycle wheels, had never been tested with the *Bremen* fully loaded. The undercarriage is fixed under the tail of the machine."

IT is our friends who do us harm. State Senator J. Griswold Webb, New York, wrote to Mayor Walker suggesting that the words "NEW YORK CITY" in letters three feet high be painted on some prominent building in New York so that lost aviators will know what city they are flying over. The Mayor grinned and said it was a splendid idea—"with that sign up, fliers will no longer confuse this town with Hoboken, Hohokus, and Hong Kong." Now I suppose someone will suggest to Bill MacCracken that the words "UNITED STATES OF AMERICA" be laid in white stone in various sections of the land so that pilots will know what country they are flying in.

THE War Department announces that a study is to be made as to the advisability of camouflaging army tents. If they will study out how to get more aircraft and more pilots so they can fly over and see what the enemy has, they needn't spend so much time trying to cover up what we have. We needn't worry about enemy bombers so simple that they would spend their time bombing army tents—if they're that dumb, even the few airplanes we have will soon shoot them down.

A LADY has offered prizes totaling \$100 for the best poems about flying achievements. You shouldn't do this, lady, you really shouldn't. Why encourage crime? But since you've brought this on yourself, I'll put in my entry:

A fledgling bird sat in a tree,  
His little heart a-quiver.  
"First solo flight," he said to me,  
"Just makes me shake and shiver."  
"Be bold, young bird," I gently said,  
"And tell yourself it's fun."  
"Console yourself that you don't have  
"To test an M. O. One."

(Continued on next page)

## PERFECT VISION



...with day-long comfort  
Willson Pilot's Goggles  
give the utmost safety

**W**ILLSON Pilot's Goggles are built to U. S. Navy specifications. They are designed by optical specialists, and made with the strength and precision of a microscope. They have meniscus-ground lenses, which *neither magnify nor diminish*, but give *perfect and undistorted vision no matter which way the eye is turned*. These lenses enclose the eyes in an arch of glass, with the goggle frames and air-tight mask far back on the cheeks and forehead—beyond the area of vision.

Willson Goggles are equipped with a rubber vacuum mask that adapts itself to every contour of the face without noticeable pressure and permits no leaks whatever.

The venturi tube ventilating system built into the frames prevents any sign of fogging under flying conditions.

In the pilot's goggles, the aluminum frames are enameled dull black like the inside of a camera—no glint of sunlight on metal frames will ever blind their wearer. Safety . . . durability . . . comfort . . . they give the maximum of each. Yet they are priced no higher than many commercial goggles that do not meet Navy specifications . . . \$20.

Other Willson Aviator's Goggles are the Willson Observer at \$10. In the use for which they are designed, they will also give surpassing satisfaction during years of service. At the better opticians', everywhere.

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*Aviation Division*

READING, PENNSYLVANIA



## ALUMINUM FUEL AND OIL TANKS

*The highest development in  
tank construction*

### Lightest In Weight

Most durable—leak-proof—  
will not corrode. Our tanks  
have been put to the test and  
are proven. Perfect satisfac-  
tion to you—no matter what  
size or shape you may require.

Our tank in your plane re-  
lieves you of all tank worries.

See our exhibit at the New  
York Aviation Show—Booth  
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CORP.**

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## When accuracy counts use Reed & Prince Products

Every Reed & Prince Product meets the U. S. and S. A. E. Standards in strength, finish, dimensions.

Use Reed & Prince High Carbon Steel Screws—there are every type and size of Wood, Machine, Cap and Set Screws. All varieties of Bolts, Nuts, Rivets, Burrs, and hundreds of Specialties.

Select any finish—nickel, blued, copper, bronze, brass, galvanized, plain, polished.

Reed & Prince Products are unequalled for aeroplane work. You can depend on Reed & Prince quality and accuracy. The standard of both is the highest.



**REED & PRINCE MFG. CO.**  
**WORCESTER, MASS., U.S.A.**  
WESTERN BRANCH AT CHICAGO-121 NORTH JEFFERSON ST.

(Continued from preceding page)

**CAPTAIN DE HAVILLAND**, according to the gnus, claims that his Moth with Handley-Page slots is "fool-proof." Bring on your supposedly fool-proof plane, Captain. And I could bring on at least half a dozen pilots who could beat it without half trying. No moving vehicle, in the air or on the ground ever has been constructed, or ever will be constructed, that some idiot cannot bump himself off in.

**DO** you know that—? But why ask a fool question like that! If you six readers knew anything you wouldn't be reading this at all. Of course you don't know it, so I'll tell you. The United States Biological Survey has proofs that two gulls have made the trip from Germany across the ocean, while two kittiwakes, banded and let loose in England, were found in Newfoundland. An Arctic tern, banded in Labrador, flew to France, but was dead when picked up. There are birds that summer in Canada and winter in Chile, while the Canada Goose summers in the Arctic and winters in Louisiana.

The question is—though no one asked it—how do the birds know enough to make those flights? How can a bird take off and fly across an ocean and know that it will find land on the other side? What gives them the idea of starting? What, for that matter, gives an ocean flier the impulse? I've never figured that out, and I know most of them. How is it that I, for instance, know enough to fly back home to New York? Well, I can tell you the answer to that one—my mother was frightened by a homing pigeon. And now that I come to recall it, I remember George Haldeman's admitting to me that his grandmother was frightened by a seagull. But the bird that wins my admiration is the ordinary wild duck. It spends the summers up North and the winters down South, like Harry Rogers.

### AVIATION CLUBS IN SECONDARY SCHOOLS

(Continued from page 51)

organized club. The project naturally includes the building of parachutes of the army pilot chute pack type, as well as larger types to bring down the entire plane. The model can be flown in the school auditorium with an arrangement by which the parachute can be liberated as the rubber motor, releasing in tension, operates a spring in the fuselage.

Along with this should come the study of aircraft navigating instruments, compasses, air speed indicators, turn and bank indicators, altimeters, rate of climb indicators, etc. It is also quite important to emphasize the decrease during recent years in accidents in aviation for the number of miles flown.

With these safety projects may be included the building of a model weather bureau for the school, at which daily records of air pressure, wind velocity, temperature, rainfall, etc., may be taken by the meteorological division of the squadron. This entire model weather bureau may be exhibited at the special school assembly through demonstrations of the operations of each instrument by members of the squadron.

*Third*—The examination of candidates for the aviation school. A project simulating the examination of regular aviators can do much toward bringing boys to realize the value of physical fitness for aviation. This ought to begin in the squadron with a study of how candidates are examined, every one in the club being required to take the test. Unfortunately, not all of the test can be carried

(Continued on next page)

## Northeaster

FLYING TOGS



### NORTHEASTER HELMETS

The complete absence of wrinkles insures an excellent appearance. Northeaster helmets are made of the finest and softest gloveskins, with soft two-ply chin straps secured by sure-hold buckles. The goggle straps are two-ply and sewed in to stay.

Model 276—Navy type, chocolate gloveskin, chamois leather lined. Each, \$5.50.

Model 274—Navy type as above, but with ear puffs. Each, \$6.50.

Model 278—Navy type, chocolate leather chamois lined with warm wool interlining between chamois and outside leather. Each, \$8.50.

Model 275—Army type, tan gloveskin, silk lined, with ear puffs. Each, \$6.00.

Model 300—Handsome olive drab soft capeskin, soft leather lined. \$5.50.

### EXCELLENT HELMETS AT POPULAR PRICES

Model 180—Many students find it inconvenient to pay as much as \$5.50 for a helmet. The model 180 is an excellent, serviceable helmet at a low price. Made of soft brown lamb-skin, suedine lined, snug fitting all around, neatly stitched, with adjustable chin strap and goggle straps. Each, \$3.00.

Model 181—As above, black leather. \$3.00.

Model 185—Same as No. 180, but heavy, warm sheepskin lining for winter wear. \$5.00.

Model 183—As above, black leather. \$5.00.

### CLOTH HELMETS

Model 273—White soft garbardine, unlined. Each, \$2.00.

Model 260—Tan soft garbardine, unlined. Each, \$2.00.

Model 272—Olive drab cloth garbardine, satine lined. Each, \$2.25.

All helmets supplied in following head sizes 6¾, 6⅞, 7, 7⅞, 7¼, 7⅝, 7½.

**S**elect any article in this advertisement, write us your size and send a check for the purchase price. We shall send it by return mail. If, upon receipt, you are not satisfied with your purchase, we shall immediately and cheerfully refund your money. Send for complete catalog of goggles, flying suits, etc.



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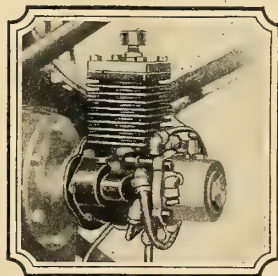
## Dependability in Air Travel Starting



More and more aircraft manufacturers are indorsing the Heywood Starter by adopting it as standard or optional equipment. **DEPENDABILITY**—the one essential quality that assures safety in air travel—that is the outstanding quality of the Heywood Starter.

Engineering of the highest order combined with precision manufacture, makes the Heywood Starter positive in action—absolutely dependable whenever you pull the starting trigger.

The Heywood Starter trigger located on dash releases compressed air that rotates motor at the required speed and injects a carburated mixture into the cylinders in firing order. Unfailing and dependable regardless of weather conditions.



Complete details and installation data will be sent on request. Give make and model of motor.

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SAFE  POSITIVE  
DEPENDABLE CONVENIENT

# HEYWOOD self STARTER



# You need these Starrett Tools



No. 224AA



No. 124

The handy, all-purpose No. 224AA Micrometer, for example, with readily interchangeable anvils to give it a range of 0 to 4 inches. (No. 224A with range 2 to 6 inches).

The wonderfully convenient No. 452B Cylinder Gage for re-grinding work; with combination rigid and toggle-joint handle and locking mechanism. Built to stay accurate under long, hard service.

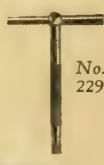
These and the No. 11 Combination Square—eight tools in one—No. 124 Inside Micrometer and No. 172D Feeler Gage are only a few of the time-saving, super-accurate tools described in the great Starrett Catalog and available at your tool dealer's.

Write for free copy of Starrett Catalog No. 24AD describing over 2500 high grade tools.

THE L. S. STARRETT CO.  
World's Greatest Toolmakers  
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No.  
172DNo.  
452B

No. 11

No.  
229

## Use Starrett Tools

(Continued from preceding page)

out, but at least the idea of the test can be given to the boys. The school at large may get a vicarious taste of what it is like to be examined for physical and mental fitness by seeing a demonstration of the examination at an auditorium exhibition. Here the candidates may be examined by the school doctor for defects of vision, hearing defects, physical condition (height; weight, etc.), mental response to situations, whirling chair tests, etc., and heart and lung condition. No amount of lecturing and talking to high school pupils could possibly have the effect of seeing candidates rejected because of bad eyesight, weak heart, or poor physical condition. All adolescents are hero worshippers, and at present our aviators hold the popular sway. Indeed, in the heart of nearly every boy is at least a dream that he may be strong and sturdy enough to pass the tests.

Although building and flying model airplanes is about as far as junior high school youths can go, senior high school boys may advance into the actual building of real planes or gliders. At the same time they may take up the study of different types of motors and types of planes with the designing of a large model plane. Much harm can come to the movement by allowing boys to take chances in flying old models that have been discarded. All of this work in our secondary schools should, I believe, be confined to the ground. There is time enough after the youth leaves school to take a course at a good flying school where he will be working with the best of machines. What is more, the Reserve Officers Training Corps of the Army Air Corps provides excellent instruction in aviation and has in the past cooperated in giving aviation training to the clubs that have been organized all over the country. Although the course is quite technical, a youngster who has been through the ropes of the early aviation clubs and has retained the high school subject matter is able to master the course quite well.

All of these efforts by school officials to interest young persons in aviation, or rather perhaps to take care of an interest already developed, are most significant. Those of the younger generation will know far more about aviation than their parents ever can expect to know. Our future aviators are in our schools today, building models, experimenting with gliders, getting the content of the ground school instruction, and most of all, beginning to think of aviation in terms of its possibilities, its comparative safety and utility. The aviation interests of our country can do no better than to further in every way possible this program of aviation in the schools.

### COMMERCIAL AVIATION IN SOVIET RUSSIA

(Continued from page 58)

the air. Plans are now under way to introduce this method also into the fisheries.

The progress in commercial aviation in the U.S.S.R. has been achieved with the aid of comparatively small subsidies from the government. During the entire period up to 1927, the Soviet air companies received from the government subventions totaling only 1,325,208 rubles (\$680,000). In 1926-27 state financing amounted to 803,271 rubles, and only during the past fiscal year was the state allotment increased to 2,547,000 rubles (\$1,310,000).

The ambitious five-year plan of development of commercial aviation recently formulated by the government will involve financing on a much more extensive scale. The plan provides for the establishment of a number of new

(Continued on next page)



ANNOUNCING

the

# Super-Gull

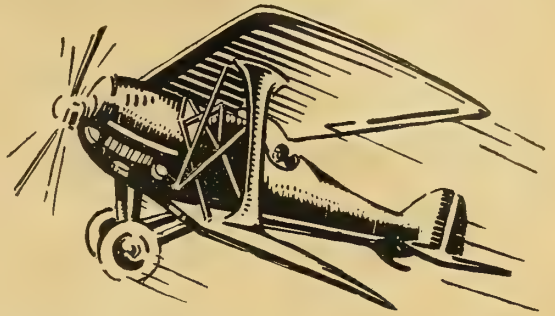


A NEW all wood flying boat powered with a Wright J-5-A motor and shown for the first time at the New York Aviation Show, Booth A 8, February 6th to the 13th.

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Here is all  
the aviation knowledge a  
beginner *or* a layman needs

All the principles of modern airplanes, how they fly and why; explained in the *A B C of Aviation*, by Major Victor W. Pagé, America's foremost authority and instructor. Sent C.O.D. for only \$1.00

#### JUST PUBLISHED

This 160-page book, the *A B C of Aviation*, by Major Victor W. Pagé, brings you the essential knowledge and understanding of aviation that every beginner needs. Major Pagé who has been a leading instructor and engineer throughout the entire history of aviation has condensed into simple, every-day language all the information that is so vital to a beginner and so necessary to the layman who wants authentic, understandable information on every phase of this industry.



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This unusual book lays before you the complete story of all types of modern aircraft, their construction, their engines, their control and flight, just as if Major Pagé anticipated all your questions and answered them for you. He weaves his story from the very beginning of aviation up to the adaptation of modern principles of flying. Every technical word that he uses is explained in the text, and he gives the reason for every statement he makes.

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Get this new, up-to-the-minute, comprehensive, authoritative 160-page guide, the *A B C of Aviation* and keep it for 5 days. If it does not completely sell itself as one of the most valuable texts ever written for anyone who wishes to become airwise, then return it for full refund. Enclose no money. Just pay the postman one dollar and a few cents postage. Fill in and mail the convenient coupon at once.

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## Imagine— a Plane Cabin in which you can Talk in Normal Tones



—as you can in this  
**Stinson-Detroiter**

The deafening noise of the motor is reduced to a low drone in the cabin of this Stinson-Detroiter. Conversation is easy.

Furthermore, the cabin is comfortably warm, even in the severest weather.

It is accomplished by the sound-deadening and heat-stopping blanket of Balsam-Wool, the ideal insulator for airplanes.

Ideal because it is especially light—because it is efficient—because it is flexible—fire-safe—and inexpensive to buy and install.

More and more marked is the tendency toward greater comfort in airplanes—and toward Balsam-Wool as the means to attain it.

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# Balsam-Wool Blanket

it tucks  
in



(Continued from preceding page)

routes during the next few years, which will bring the length of airways to a total of 41,928 kilometers (25,995 miles) by 1933, an almost four-fold increase. It is estimated that, in the intervening period, an average of 5,000 kilometers (3,100 miles) will be added each year to the length of airlines. The number of passengers and the freight carried is expected to increase six-fold and the amount of mail carried, four-fold by 1932-33.

The plan calls for the establishment of long transcontinental air routes and a number of lines to the remotest sections of the extensive territory of the Soviet Union. In 1929 the Frunze-Alma-Ata airline in Turkestan will be extended to Semipalatinsk in the southwestern part of Siberia, thus serving as a connecting link between the Central-Asiatic railroad and the Trans-Siberian railway and the Siberian air routes. The Siberian air route, Irkutsk-Yakutsk, which now has a branch to Bodaibo, will be extended another 250 kilometers (155 miles) in order to establish air communications with the gold fields of the Aldan region, the "Russian Klondike". One of the outstanding developments this year will be the establishment of direct air mail service between Moscow and Irkutsk, a distance of 4,500 kilometers (2,790 miles). At present trials are being made with mail service between Moscow and Novosibirsk, the capital of Siberia, a distance of 3,200 kilometers (1,984 miles). The Moscow-Irkutsk line will eventually establish connections with the Deruluff lines operating from Berlin, thereby establishing air service between Siberia, Mongolia and Western Europe.

For 1930 the plans of the Soviet economic organs call for the establishment of a 3,000-kilometer (1,860-mile) line between Moscow and Tashkent (Turkestan), which will connect the existing airline from Tashkent to Kabul in Afghanistan with Moscow and the countries of Western Europe. This line and the Moscow-Irkutsk line will be used only for air mail at the beginning but will carry passengers within a year or two. In the northern regions air communication will be established between Archangel and Mezen and Ust-Zilma, Soviet lumber exporting centers near the White Sea. A tourist and air mail line will be established along the Volga River, which, in the first year, will reach from Astrakhan, near the Caspian Sea, to Saratov and which later will be extended to Nizhni-Novgorod.

The present route from Mineralnye Vody to Baku will be changed to include Piatigorsk and Tiflis, which will involve crossing the Caucasus Mountains in trimotored planes. Within the next year or two Ukrvozdukhput (Ukrainian Airways) will establish a Trans-Ukrainian route connecting Kharkov and Odessa, with a possible extension to Constantinople.

In the succeeding years these lines will be extended still farther and a number of new lines will be organized. By the end of the five-year period, the Trans-Siberian air route will probably cross the entire continent to Vladivostok and may possibly extend to Tokio. If the plans of the Soviet authorities are fulfilled, it will be possible by 1933, to travel from Moscow to Teheran (Persia) in 15 or 20 hours. The interior of Siberia will have a number of airways which should contribute greatly in developing these regions. Besides the establishment of the main routes, the five-year program also calls for the organization of a number of local routes on the order of the Moscow-Nizhni-Novgorod line which is now in operation. The total of these local lines is expected to amount to 5,500 kilometers (3,410 miles) by the end of the five-year period. Night

(Continued on next page)

# 1929 NATIONAL BALLOON RACES

(Under auspices, National Aeronautic Association)



UNIVERSITY of PITTSBURGH  
STADIUM

May 4th, 1929

## PITTSBURGH AERONAUTICAL EXPOSITION

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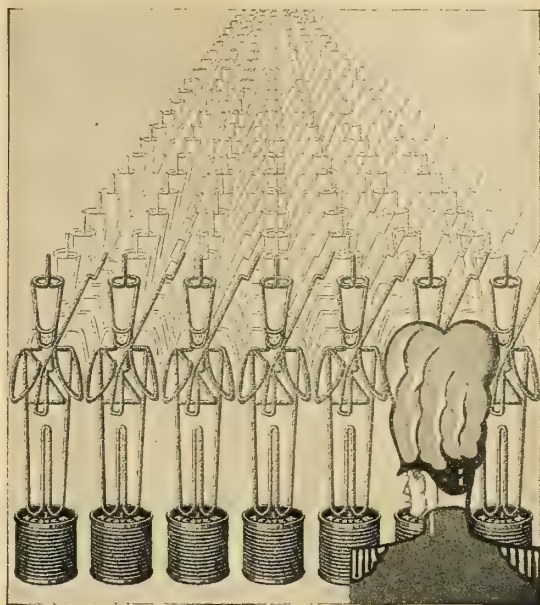
May 2, 3 and 4

(175,000 people attended 1928 National Balloon  
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Date.....

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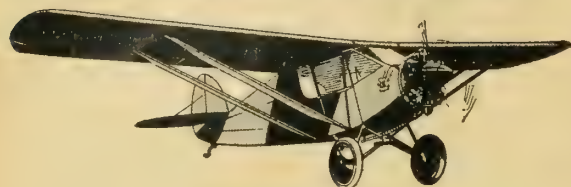
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(Continued from preceding page)

flying will be established on all the long routes with daily schedules in force the year around.

Other branches of commercial aviation will be expanded correspondingly. Appropriations will be granted to increase five-fold the area covered by aerial photography within the next five years. In the field of dusting of crops and forests with insecticides, it is expected, a minimum area of 150,000 acres will be covered by 1932-33.

This extensive program for the development of commercial aviation in the U.S.S.R. will necessitate a large number of additional planes. Up to recent years most of the airplanes used by Soviet civil aviation organizations have been of foreign manufacture. However, plans are now under way to build up airplane production within the country itself. The construction of a number of factories and repair shops, involving an outlay of 53,000,000 rubles, is now proposed. This sum, as well as the remaining funds required for carrying out the program from the federal budget, will probably be provided through a flotation of a special loan for commercial aviation and from financing by local groups, especially for organizing local air routes.

The expansion of the activities of civil aviation in the U.S.S.R. has been reflected in the increased purchases of American aircraft products. Orders placed by the Amtorg Trading Corporation for aircraft equipment, engines, etc., during the past two years have totaled \$1,500,000. During the past year, these purchases showed an increase of 118 per cent over the preceding year.

## DEVELOPMENT OF AIR-COOLED ENGINES

(Continued from page 44)

saved in the power plant which resulted in materially lower landing speeds and the greater power of the water-cooled engine, the radial showed almost identical high speed.

Since that time planes have been designed around the larger air-cooled radial, and advantage has been taken of their characteristics. As a result the Vought Corsair, a two-place machine, has a speed of 160 miles per hour which is equal to that of the previous standard single-place water-cooled fighter. Fighters designed around the radial show considerably higher speeds; for example, the new Boeing design 83 has a speed of 183 miles per hour.

The last contention was that the radial engine fighter could not dive as fast as a ship equipped with a water-cooled vee engine. It was believed that the radial engine itself could not withstand high crank speeds. The solid big end master rod and divided crankshaft design, however, was adapted precisely for this purpose. How well it provides, for high crank speeds has been proved by the Naval fighting squadrons. It was further believed that the radial equipped ship could not accelerate as quickly, or attain as high a speed in a dive as the water-cooled fighter. Recently at Anacostia an Army test indicated that the air-cooled radial Wasp-equipped Boeing fighter easily out-dove a standard Army water-cooled service ship. Moreover, at the recent races at Los Angeles, this same Boeing air-cooled fighter climbed to 10,000 feet and landed before any of the water-cooled planes had reached the required altitude. The remarkable all-around performance qualities of this Boeing fighter, the first single-seat job designed around the Wasp, has made it extremely interesting to both Army and Navy air services.

The other inherent qualities of air-cooled radials should not be lost sight of. Due to their compactness, a much more closely coupled ship can be laid down, and because of their

(Continued on next page)



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(Continued from preceding page)

lightness considerably higher rates of climb are obtained. These qualities all provide for greater maneuverability, which is of utmost importance in a fighting ship. Again because of the weight saved and compactness, the planes are smaller, which makes them particularly desirable for Naval carrier work.

Another factor which must be given serious consideration is that of cost. The air-cooled radial is cheaper to construct, power for power, than the vee type engine, and there is not the radiator to be considered. Besides this, the installation can be made more cheaply. Unless the gain in performance (even for military purposes) is sufficient, however, we are not justified in paying a high premium to obtain it.

The radial has still another advantage due to its compact construction; namely, that engine-driven superchargers are practical. Because of this and the reserve cooling available with the direct cooling cylinders, considerable supercharging can be provided without increased weight in the power plant or additional drag in the plane. Supercharging water-cooled engines involves the addition of considerable weight and some added resistance due to larger radiators and external superchargers. The radial, therefore, has another advantage at high altitudes where, after all, the actual fighting is done. Of course, if the maximum supercharging is required, external superchargers can be used on radials with inter-coolers. A Wasp thus equipped holds both the world's land and seaplane altitude records.

The water-cooled engine with wing radiators may have one possible advantage, and that is for extreme high speed. Yet it does not seem reasonable to think that wing radiators are desirable for fighting ships because of their vulnerability. Moreover, such a ship is inferior to the air-cooled job at high altitudes because of its greatly increased weight. In considering the performance of racing planes equipped with wing radiators one should keep in mind the fact that in the case of ships with a speed of approximately 200 miles an hour there is usually a difference of about 15 miles an hour between ships equipped with wing radiators and those with the usual tunnel radiator. This difference in speed increases greatly as the high speed of the planes approaches 250 or 300 miles an hour.

The speed of radial-engined ships is greatly influenced by the engine cowling. A cowling which increases speed 19 miles per hour has been devised by the National Advisory Committee for Aeronautics. It is understood that the Army unit at Wright Field is also about to make a very interesting contribution along more or less similar lines. All this goes to show that, as our aerodynamic experience with this type of engine grows, there is good reason to believe that we may even reach the speed of the wing radiator jobs and retain all the inherent radial advantages as well.

Commercial power plant requirements stress other factors, principally reliability or safety, cost of operation per hour (which includes depreciation and overhaul charges throughout the life of the engine) and maximum pay load per horsepower. Air-cooled engines are the most reliable because of the elimination of the troublesome radiators and piping. Their low first cost and long life give a low depreciation figure. This, coupled with a low man-hour overhaul figure (since the radial need be dismantled only at long intervals) and low fuel and oil consumption, results in low operating costs. From actual service figures, overhauls are required only every 300 to 500 hours, depending on the service. Gasoline consumptions of 18 gallons per hour for 400 h.p. engines averaging 120 miles per hour at

(Continued on next page)

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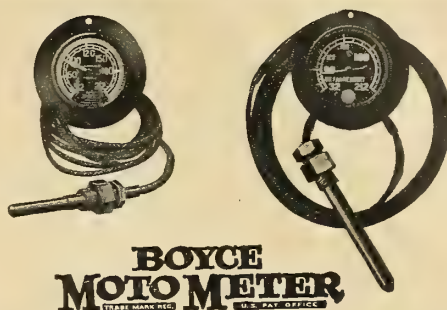
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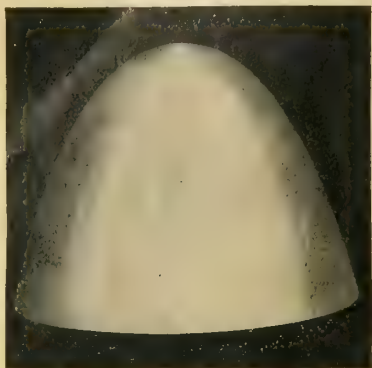
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cruising speed are recorded, as are oil consumptions of one quart per hour. Due to the weight saved, the air-cooled radial is ideal for commercial work where the maximum pay load is necessary for profitable operation. Five hundred pounds are saved by the 400 h.p. air-cooled power plant over the previous standard water-cooled engine. The weight per horsepower averages  $1\frac{1}{2}$  to  $1\frac{3}{4}$  pounds. These qualities have made the air-cooled engine supreme in commercial work. In the United States practically all the mail will be carried next year by air-cooled engines. Not a single new weight-carrying ship is known to be contemplated around a water-cooled engine.

Therefore, it is evident that air-cooling has not only survived all possible service tests, but has, as a result of its superior performance, superseded water-cooling for all commercial work, and for practically every military purpose. It has been a long, hard struggle because the preponderance of experience was with water-cooling. The future is sure to bring even more decided improvements in air-cooled power plants, and in the performance of planes equipped with them.

## KEEPING IT UP

(Continued from page 45)

veys and reports and recommendations, and at last it was decided to put the airport exactly where it should have been put in the first place. And lo and behold, the real estate value of the proper and suitable site had gone after an altitude record of its own, and the city had to pay through the nose for it good and proper, while the city fathers and their uncles and godfathers stood by and shed crocodile tears into large silk handkerchiefs. And at last the city had an airport, all wool and a yard wide or even more, and the city fathers and uncles and godfathers all went to Florida for the winter.

Is this a system? You bet it is. And there's only one way to beat it. The really air-minded people of your community and every community (may their tribe increase!) have got to stick out for their rights and convictions, and accept no substitute. Three times out of four a bad airport may turn out worse than no airport, for one of these days it will have to be junked in favor of the good airport which the city should have had in the first place. You can't patch an old pair of pants in any way that will make it worth wearing, and you can't cure the troubles of an airport which is in the wrong place.

Excuse me. I didn't intend to talk about airports. I was talking about endurance flights.

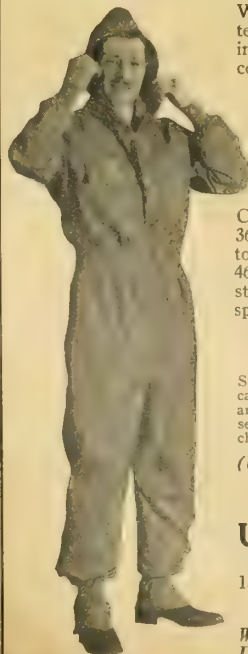
I have no intention whatever of discounting the importance and romance and thrill of endurance performances. How could I? I'm a married man myself. Those of you who are married don't need me to tell you that matrimony is the world's chief and champion long-distance endurance stunt, against every sort of hazard that tries to spoil the performance. The rest of you ought to take warning. You may go clear up in the air on your wedding day, but you won't stay there without working at it. It's not the first flights of romance that count in the long run; it's the upkeep.

Consider the innocent and ignorant bridegroom as he looks on life from the six-mile ceiling of his wedding day. Through the low visibility of a rosy fog he surveys the three electric irons and the coffee percolator and toaster that loom so large and shiny on the table of wedding presents. He does not see the spectre of the screwdriver that hides be-

(Continued on next page)

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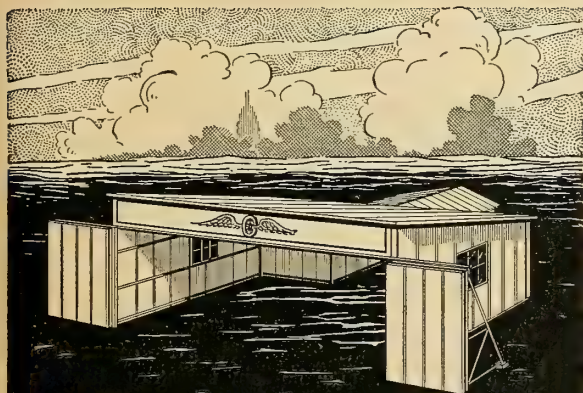


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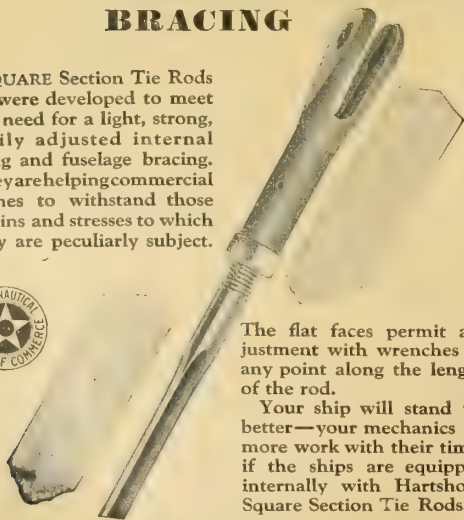
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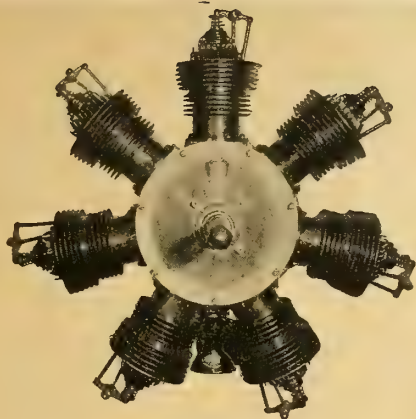
hind them, nor the phantom of the pliers gnashing their teeth in greedy anticipation. He leads his bride into a new house, and together they rejoice in its door knobs and wall-paper and early Renaissance electric light fixtures and Dutch tiled bathroom and Old English breakfast nook and Colonial mantel and Italian library and Spanish dining room. Ah, if this were all that marriage involved, how simple life would be! Some few years of adjustment, some new habits formed, some shaping of twin destinies to a common purpose, and beyond these long years of unruffled happiness and peace. But, alas, he forgets! Or perhaps he does not know! Or perhaps he wilfully will not admit that there are such things as plumbing and furnaces and screen doors, and windows that break, and faucets that leak, and doors that shrink and stick. And beyond these another sort of countless domestic contraptions that merely bide their time until his ruin is ready.

I have myself already met this Waterloo and also two Balaklavas and a Flodden Field. I have been through the mill and also the meat-grinder. After a pitifully few years of security my household gods began to fall apart on me. The house began to totter, and everything in it except my wife was suddenly frail and decrepit. I ran frantically from one tool to another as long as the tools held out, and then I ran for my neighbors' tools. I patched and mended and darned my house and all its machinery. It was a losing fight but I fought it grimly, withholding my property from the ashen by sheer force of will, aided somewhat by string and tire-tape. I devised a schedule of domestic duties which took practically all my time. On Monday I plumbed, wrenching at pipes and working wonders with washers. On Tuesday I electrocuted, tinkering with wires and fuses and shocking myself and my young family. On Wednesday I carpentered. On Thursday I masoned and laid bricks. On Friday, I glazed, and was rarely more than three windows in back of the children and their destructive instincts. On Saturday I did general janiting around the house and bought a new set of tools. On Sunday I went to church and needed it.

But this could not go on. The house was gaining on me. There was and is yet a broken window in the third floor that will stay that way so far as I am concerned. There was and is yet the missing leg on the phonograph which is replaced by three volumes of the world's Best Literature. The electric iron and toaster are about reduced to their elements. The shelves I have put up have fallen down again for the third and last time. The grate of the furnace is broke and so am I, and the baby appears to have swallowed the screwdriver and I don't much care. I have come to the end of my rope and also of my washers and fuses and tenpenny nails and my wife's hairpins.

So I am adopting a new policy. At my hand is a telephone—which thanks to the Telephone Company I have never had to fix—and at its other end are a dozen electricians who will cheerfully leave their firesides to regenerate my iron and fuses, at a cost that will not much exceed that of rewiring the entire establishment. Down the road there is a contractor and builder whose baby needs new shoes, if it is like all the babies I know. There are masons and carpenters and plumbers all over the place, driving Cadillacs and Packards that must be fed with gasoline and oil. They can have my house and household machinery, and I hope they do the right thing by them. I shall leave all future fixing to the professional fixers, and may heaven have mercy on their souls.

(Continued on next page)



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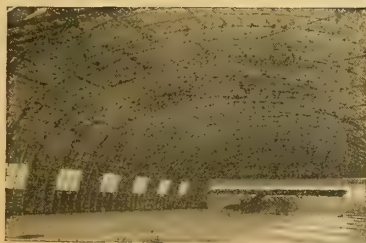
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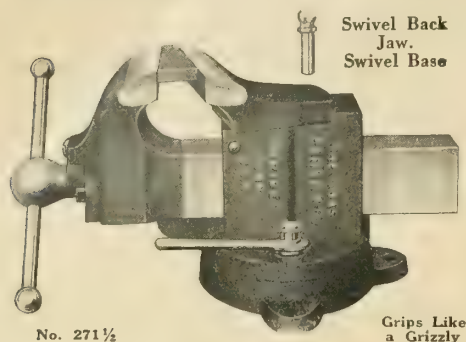
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(Continued from preceding page)

Out of this parable of experience I shake down at least one aeronautical conclusion. There are two sorts of endurance, and we do well not to mix them in our aeronautical meditations. One is a matter of machinery—the stamina of motors, the reliability of instruments, the breaking point of materials and the weaknesses of design. These are matters for the concern of people who are good at that sort of thing. The other is a matter of human endurance and determination to carry through with an essential job and responsibility. Just as successful matrimony is far more than a job of keeping the household goods and chattels in repair, so successful aviation is far more than a matter of motors which can run a week before they shed a tooth. It's a matter of the everlasting conviction of a job to be done, a need to be met, a use to be served. Without it aviation will never amount to much more than a bag of tricks for the amusement of newspaper reporters.

I think it is safe to say that no industry ever had so many men in its ranks who feel that way about their trade as does the aeronautical business. Without naming names it is easy to count scores of men in aviation who give it real service and devotion because they believe in its future, not merely as a money-making business, but as a contribution to the peace and happiness and comfort of the world. There are men of that sort in responsible government positions, and there is something of the same spirit in many a youngster who is trying for his wings. The endurance of that spirit is the mainspring of the progress of American aviation. It guarantees the future.

We have come a long way since Kitty Hawk, and the time will soon come when it is hardly worth while to stretch endurance records any longer and thinner. We shall cease to be particularly interested in airplanes that get off the ground and don't seem to know how to get back again. Such airplanes might as well be balloons and have a really good time. But the spirit that makes endurance records will have plenty to do for a long time in beating down the obstacles of time and space and hazard; in setting up reliable schedules right under the nose of unreliable old nature herself; in making business grow and flourish where none grew before; in building aviation securely into the fabric of civilization.

For this, good friends and customers, is a job that calls for all we have in the way of abdominal investiture. Which latter, between you and me, is nothing but a polite and parlor name for the old-fashioned virtue of "guts."

### AIR—HOT AND OTHERWISE

(Continued from page 41) fought in Twentieth Century manner with Twentieth Century weapons,—that is, airplanes and not steel decked devices which will be rendered additionally helpless under air attack by every new million that the nation spends on them.

We knew especially that Rear Admiral A. W. Marshall, one of the favored children of the present regime, was looking longingly toward the place which Admiral Moffett ought to keep, while Admiral H. B. Reeves, weary of the rise and fall of ocean's waves and so on, was anxious to be relieved of his command and hurry back to Washington's solid, soft-carpeted floors and perfumed tea parties, and rather thought that Moffett's job would be a lovely one for him.

Admiral Moffett, during his two terms, has been so active in promoting Naval flying that he has been convicted of having developed a mentality in contravention

(Continued on next page)



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(Continued from preceding page)

of that which admirals should have. He has even been accused (behind closed doors, of course; such serious accusations are not often brought openly against a Naval officer of high degree) of thinking—actually thinking, a crime of which we are quite sure that he is guilty.

Moffett, God be thanked, will not stay put. He knows what aircraft can do.

That's what makes him (for the pussyfooters, busybodies, rockaby-sailors, political pets and petters and all other of our Oriental-rug navigators) an unsafe man to have in charge of the Bureau of Naval Aeronautics. They want aviation based upon the pinwheels of their puppyhood. Moffett wants aviation which shall be an example and an inspiration to our youth, a staff and a bludgeon in the hands of our national defense, a terror and a very actual peril to our enemies, and a thing so vital that it will keep our international friendships permanently cordial.

Moffett not only knows just what wars have been but what wars will be, and therefore has no sympathy with those who would waste billions upon cruisers and other steel-trust products to be relegated to the junk heap before their paint dries if a real call comes demanding something really to protect our shores against attack.

For the past years such gentry as are scared about their jobs if our defense becomes more modern than that of the Britons against Lief Ericson's comrades, the Norsemen in their galleys in the Ninth Century, have been after Moffett's scalp and job.

Admiral Moffett must be reappointed, and if the recommendation is left to the new Secretary of the Navy he doubtless will be. But the plans are laid (and we must all watch out for them) to give him the works before Wilful Wilbur walks the plank.

The National Aeronautic Association has passed a resolution recommending Admiral Moffett's reappointment. In part its intelligent words say:

"... during his eight years of administration he has developed the best aeronautical organization in the world. In the midst of the five-year building program, the Navy needs his continued wise and efficient administration. The board recommends his reappointment."

But newspapers which sometimes speak with inspiration say that Wilful Wilbur is to settle all this finally before Hoover and his wise men take possession of the mighty seats.

**I**NCIDENTALLY, under its new President, Senator Hiram Bingham, the N. A. A. evidently is to show real signs of useful life. The Advisory Board (we think at the first meeting since it was appointed two years or so ago) has adopted a program for 1929 consisting of fifteen planks, some of them made of good, hard timber (though others are of thousandth of an inch veneer) as for instance:

"The enactment by the Congress of the United States of legislation which will correct the injustices wrought against the personnel of the Army Air Corps."

These word-collections which sound soothing, but lack guts, won't have much effect on that hard-boiled collection down in Washington.

The Furlow Bill, convalescing slowly from the horrible mutilation which it had at the hands of the Senate Military Affairs Committee, of which Senator Bingham happens to be a member, needs help. In his report this year, Secretary Davison came out for the bill in its entirety. Why didn't the N. A. A. do likewise, in plain, simple, stirring English

(Continued on next page)

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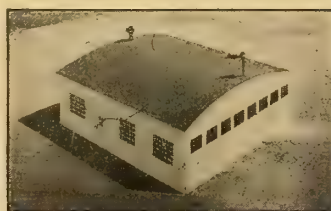
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(Continued from preceding page)

meaning business. The enactment of the Bill would correct the most serious injustices which ever have been perpetrated upon the members of any branch of our national defense.

"BILL" MACCRACKEN is a bird, and all the other birds are talking about him. Last month some small ones twittered to me, when I visited Washington, that he was about to fly the coop when the administration changes.

I went down again this week, and as I entered Bill's room in the Department of Commerce, I heard a voice which I am sure came from a raven, just like Poe's, for it croaked in mournful accents from above his office door referring unmistakably to the Assistant Secretary:

"Nevermore!"

It's hard even to think that Bill can leave the job which he so splendidly has filled and has expanded till it will take a giant to fill the vacancy that he will leave, but we are sure, because of all these conversational birds, that the Secretary will be heard from on this matter before our next issue goes to press.

Everybody in American aviation is going to miss you, Bill. You have had a hard job, and it undoubtedly has cost you three times as much annually as your Uncle Sam has paid you for performing it.

One man in your department, we believe, could follow in your footsteps, and there are not many such. You trained him, you know him, and everyone believes in him. Major Clarence Young, I mean, Bill. As long as you have got to go, we hope that you will mention this important circumstance to the birds there on the gardens back of the Big House, so that they may twitter it into Mr. Hoover's ears when he begins to walk among them, presently, as President of the United States. Clarence Young is certainly the man who should come after you.

BACK in 1920 a young and ambitious aeronautical engineer designed and built the first real, honest-to-God transport job to have been built in the United States. The wise ones looked at it, called it impractical, said it wouldn't fly. It even became known as "Burnelli's Folly."

It did fly, but lack of engines with sufficient power, made it impossible to get 100 per cent out of it. Or maybe there wasn't cash enough.

Well, anyway, it's now 1929 and times have changed, although Burnelli has not, save for the better.

He found some one who believed in him and last year managed to get capital enough to carry out his 1920 ideas, this very worthy and clear-sighted individual being P. W. Chapman, banker, of New York and Chicago, whose recent bid for all the vessels of the United States Lines, running into many millions, seems destined to make him the greatest single power in the world's mercantile marine.

Therefore, busy in New Jersey's wilds, Vincent Burnelli has once more been building, and recent tests have shown a performance outstanding even in the rapidly developing art of aircraft design and construction as it stands today. He had an idea. He knew his business. He stuck to it—and he proved it.

In the technical pages of this issue details will be found of the very creditable thing this man has done. It is of real importance to us all, for it is of importance to the industry and art.

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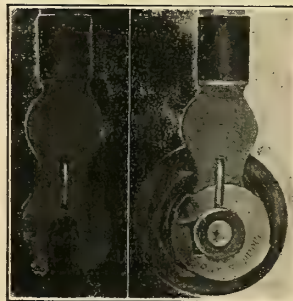
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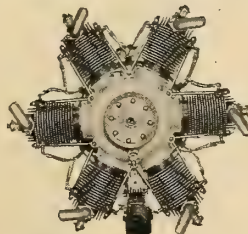
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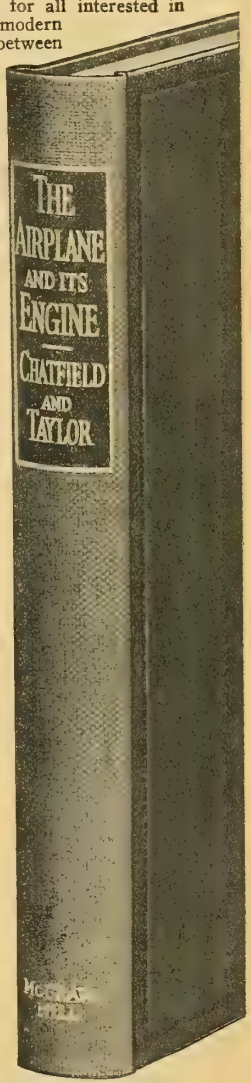
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## METEOROLOGY

(Continued from page 50)

pressure and a statement of any unfavorable condition, such as a thunderstorm, deep snow on ground, etc.

2. Promptness. So much for the character of the data or, to express it in another way, the accuracy of the service. No matter how accurate, the service will fall down unless it is also prompt. Promptness requires: (a), an adequate system of communication; (b), close contact between meteorologist and pilot.

a. Communications: Communications may be called the "backbone" of the service. It is not for the meteorologist to say what system is best, but he is sure of one thing, namely that, whatever system is adopted, it must be under absolute control. The solution appears to be the joint employment of two or more different systems. Just now much attention is being given to the typewriter-printer for ground communication. This is supplemented by radio for ground to plane communication. Very likely other, and perhaps better, means will be devised in the future. Final selection will depend upon which system is most prompt, most dependable and smoothest in operation. But, as before said, this is not a problem for the meteorologist to solve.

b. Contact. The other requirement for prompt service, however, that of close contact with the pilot, is one that he himself must provide. The telephone, or any other "distant control" arrangement, will not answer in this case. Experience is conclusive, to the extent in fact that assignment of competent meteorologists at the more important airports is now the established policy of the Government.

Before each flight, the pilot wants answers to the following questions:

1. What is the weather now at the terminal?
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Answers to the first two questions are provided by a fast and dependable system of communications. Answer to the third is given by the trained meteorologist at the airport, where he can see and study the reports "hot off the wire," make his forecasts, and talk the situation over with the pilot. Thus promptness and accuracy are combined in a service that results in a minimum of delayed and canceled flights.

The service is still incomplete, however. There are and will always be, at least for a long time to come, many oc-

casions when the weather outlook is decidedly uncertain even to the best trained meteorologist. And this is where the value of a ground to plane communications system is shown. The pilot starts out with good weather prevailing and expected, but a fog suddenly develops at his terminal. A radio message tells him so and instructs him to turn back or land at the nearest field to his destination. Thus, within the limits of human endeavor, flying is made safe as well as efficient.

The service that we have briefly outlined is not in existence today on anything like a large scale. It is being tried out here and there in an experimental way. But it forms the goal toward which the Government is working as rapidly as it can. We hope and believe that the day is near when it will be functioning on every major airway in the country.

(Paper submitted to the International Civil Aeronautics Conference, Washington, D. C., December 12-14, 1928.)

## THE QUESTION MARK'S FLIGHT

(Continued from page 62)

decided asset in both commercial and military aviation in that it will enable planes with heavy cargoes to take off more easily with a small initial supply of fuel and, after attaining sufficient altitude, to add gasoline and oil. Heretofore, bombers with a distant objective could carry only a limited number of bombs because of the difficulty in getting off with the necessary weight of sufficient fuel. Even with only one refueling in the air, the range of a non-stop flight ought appreciably to be increased. Some day there will be developed a nationwide system of refueling stations where planes will be maintained to refuel passing airliners.

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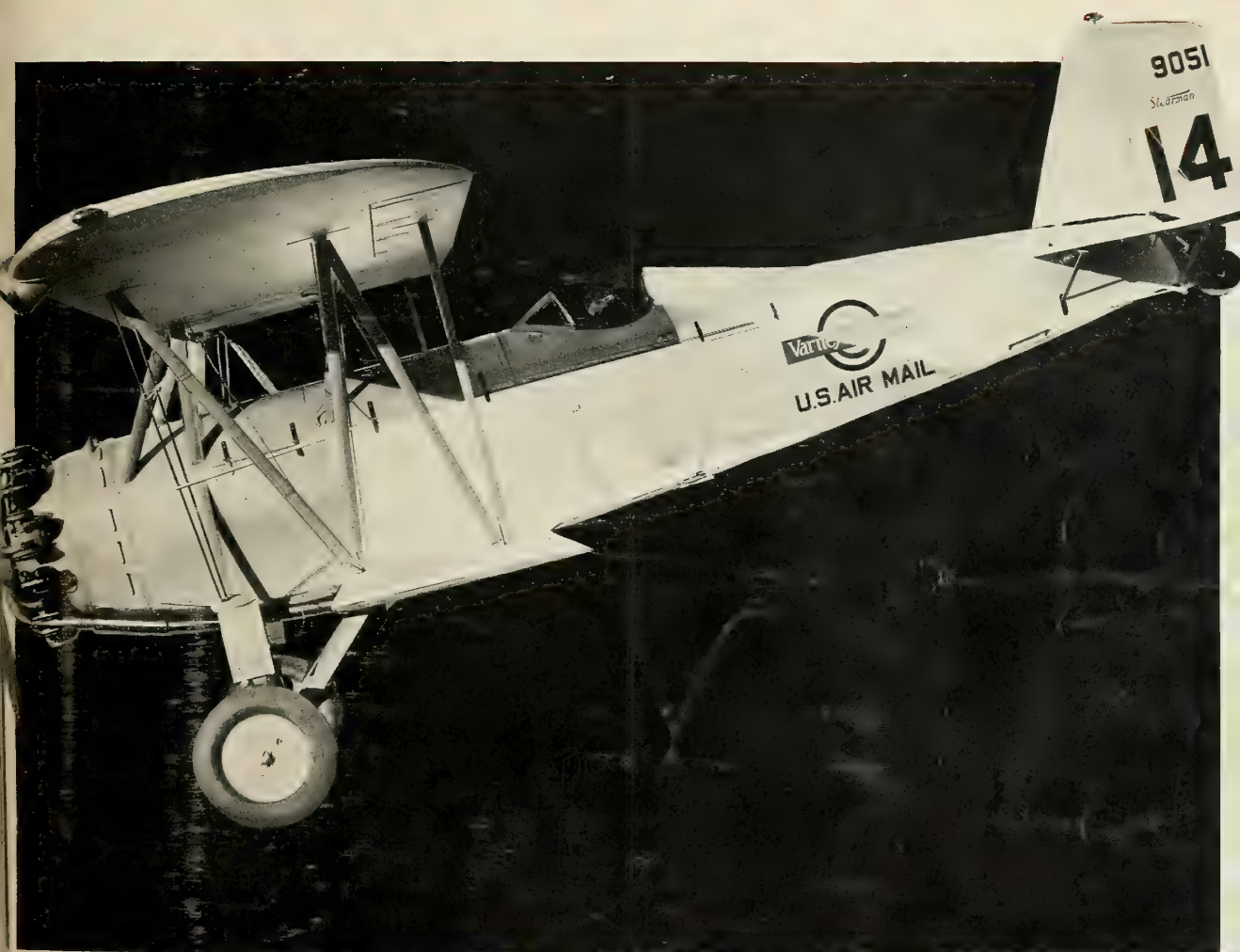
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MARCH 1929

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The pioneer flight of Colonel Charles A. Lindbergh to Panama in a "Wasp" powered Sikorsky Amphibian, has opened up the wonderland of the West Indies and Central America. Travellers from the North, pleasure bent, or in the interests of commerce, now have available swift and comfortable transportation to this land rich in natural resources and historical interest.

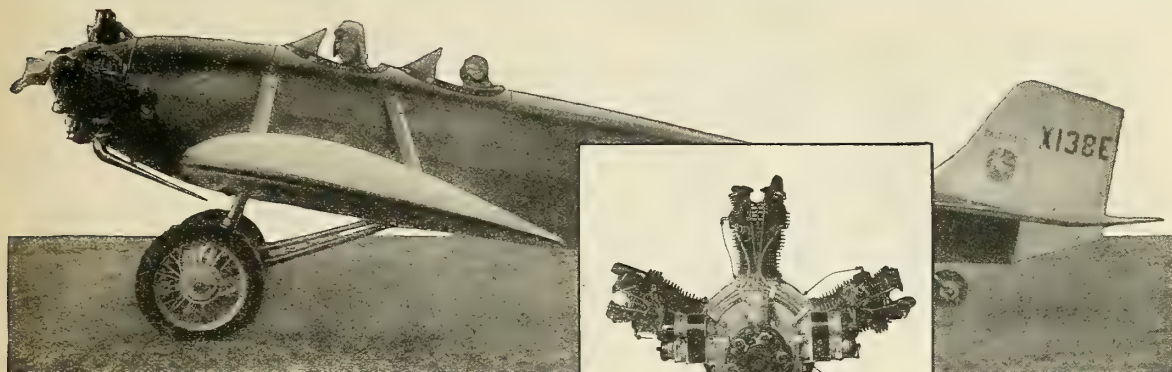
As the West Indian traveller boards the giant Fokker or Sikorsky plane at Miami, he is sure that he is flying with the best possible equipment. The combination of multi-engine security with Pratt and Whitney dependability insures arrival at the destination in schedule time.



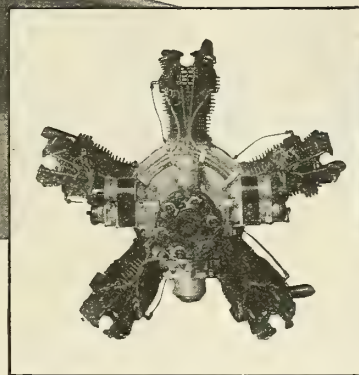
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# Wasp & Hornet & ENGINES

## A NEW CEILING in Training Plane Value



THE "GENET" five cylinder radial air-cooled engine, manufactured by Fairchild under exclusive license from Armstrong Siddeley Motors, Ltd.—the lightest engine for its horsepower in the world, and the most dependable, 80 h.p. at 2200 r.p.m., 84 h.p. at 2400 r.p.m. —British rating. Bore and stroke 4" x 4". Weight 215 lbs. Compression ratio 5.2 to 1, displacement 251 cu. in. Guaranteed specific fuel consumption is .55 lbs. per horsepower hour. Guaranteed oil consumption .025 lbs. per horsepower hour.



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The Fairchild "21" is the first commercial plane in the history of American aviation designed at every point for the instruction of student flyers. The "Genet" engine, now being produced in volume by Fairchild at Farmingdale under exclusive license from Armstrong Siddeley Motors, Ltd., answers for the first time the need for an American small airplane engine of *proven* dependability.

The Fairchild "21" is not merely good. It is at least a year ahead of the field at every point of comparison. Materials and workmanship are A plus—judged even by Fairchild standards. Safety factors have been actually doubled at crucial points. It is a low wing plane. "Floating" is eliminated and full vision is provided for both instructor and student. Top speed is 105 miles per hour, and at its cruising speed of 90

The "21"  
with its time-tested small engine  
of proven dependability  
and performance

miles per hour the "21" has a range of 425 miles. The landing wheels have an *eight foot spread*—30% of the wing span. Oleo shock absorbers eliminate bouncing. The plane can be ground looped at 40 miles per hour without scraping a wing tip.

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P. S. As is likely to happen when a good designer starts in to do a good

job regardless, the Fairchild "21" looks its quality inside and outside. Over and above its use as a training plane, a lot of the more canny and air-wise sportsmen are going to want it for personal use.

Fairchild offers a dealer proposition which will command the immediate interest and respect of your banker—and which will enable you to sell planes at a profit. Prompt deliveries in the flying season are assured to dealers who place their orders now. Write or telegraph Fairchild Airplane Manufacturing Corporation, Farmingdale, Long Island, N. Y.

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SINCE 1892



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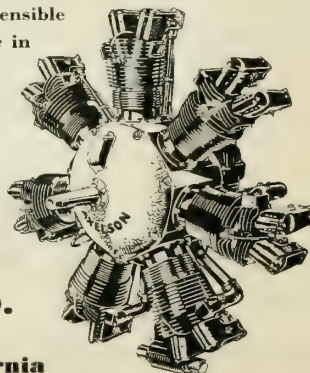


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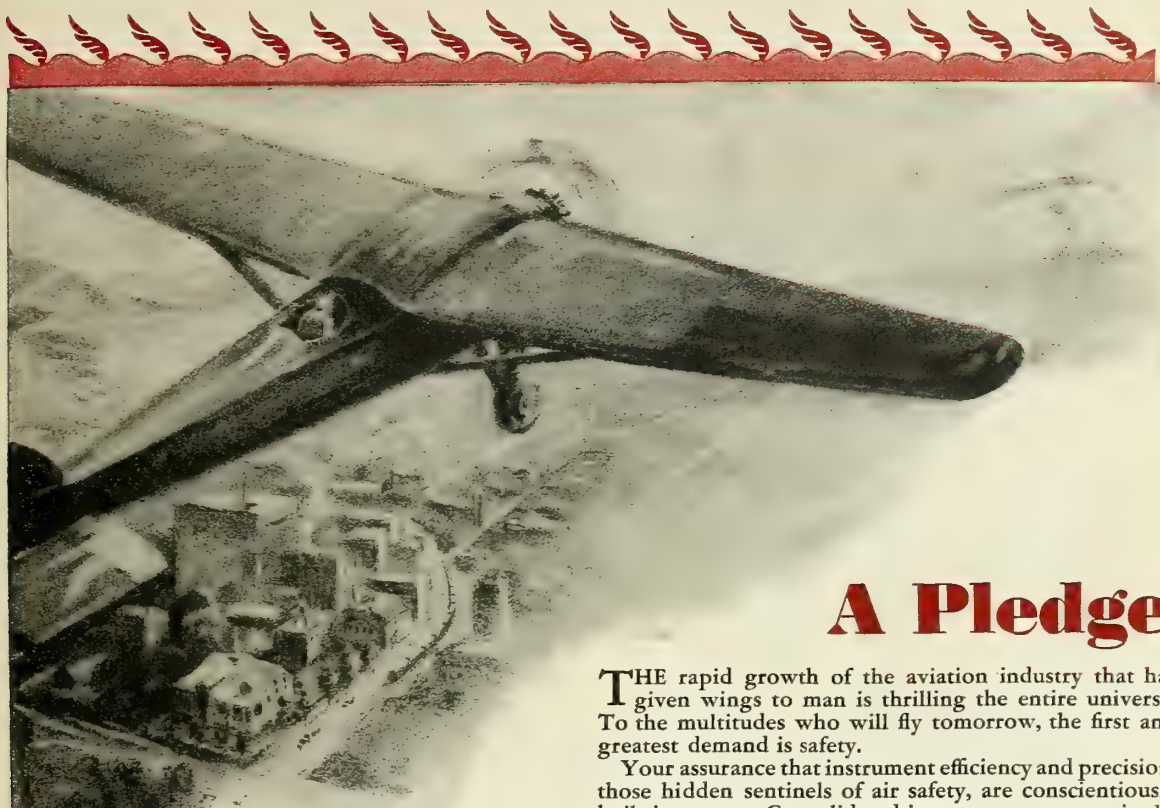
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 Fuel Pressure Gauge, Type N ☐  
 Fuel Level Gauge, Type N ☐  
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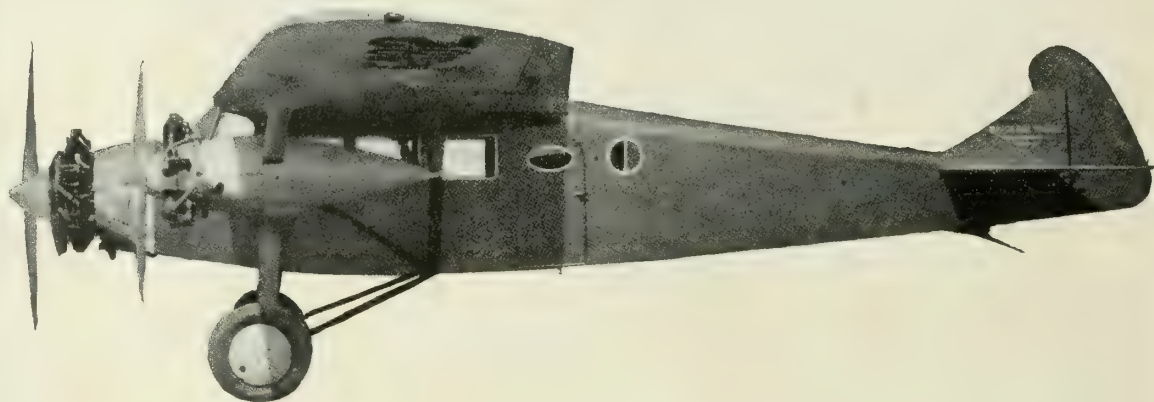
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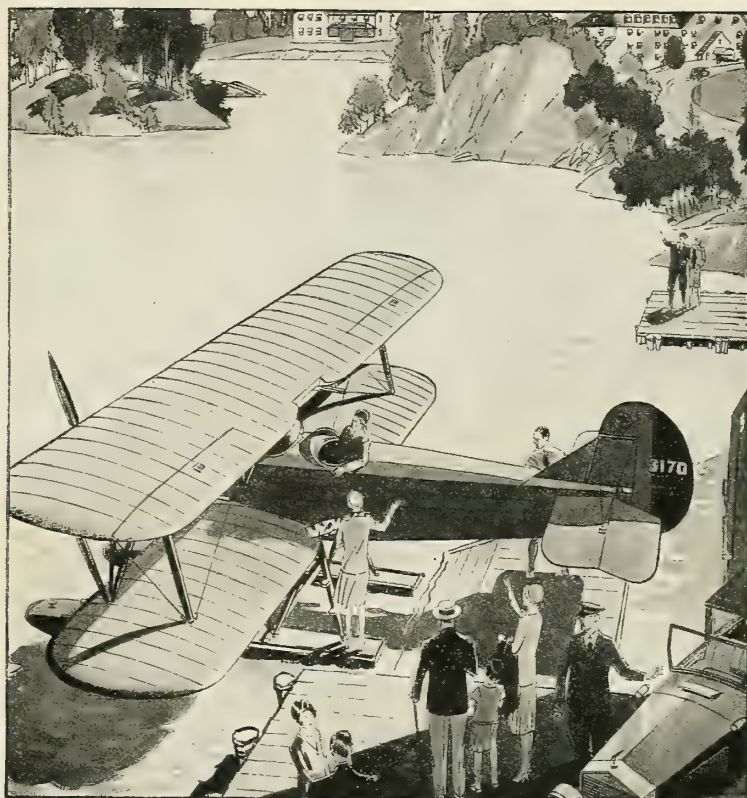


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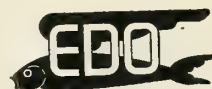
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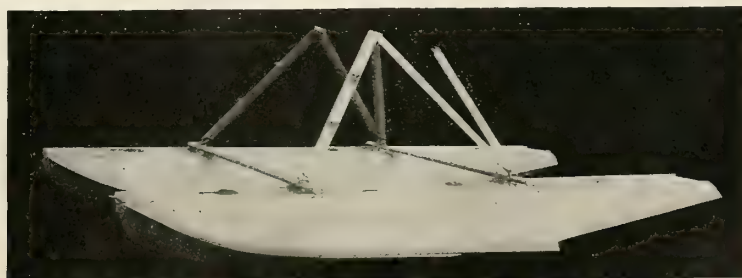
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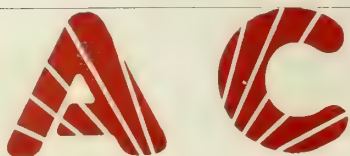


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## INSTRUMENTS FOR AVIATION

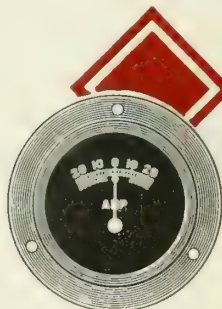
AC instruments for aviation, with plain or luminous dials, are designed and built to render infallible service. They are made by precision methods, are thoroughly tested for accuracy, are proved to be extremely durable.

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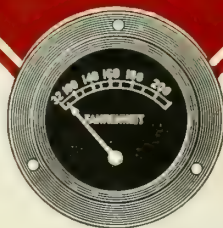
ing element, the other is an armature driven by the drive shaft. AC Flexible Shaft should be ordered separately, according to length desired.

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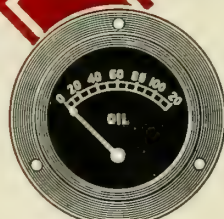
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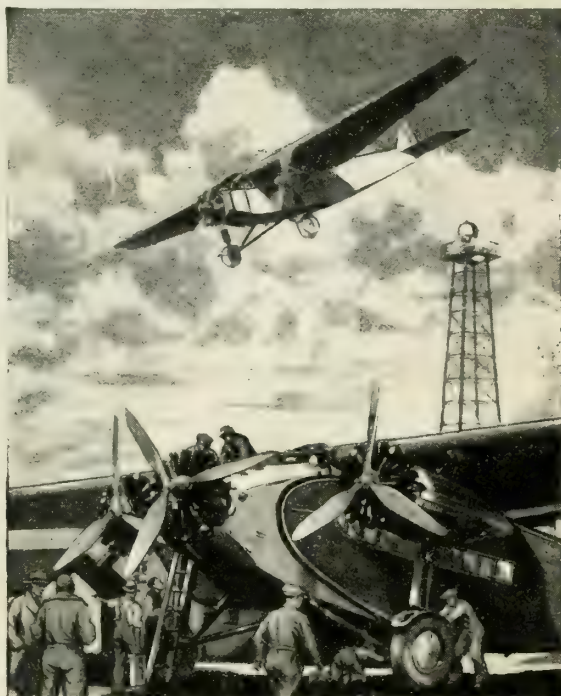
The same was true of the automobile industry. It was the men who got in "on the ground floor" who made the biggest successes.

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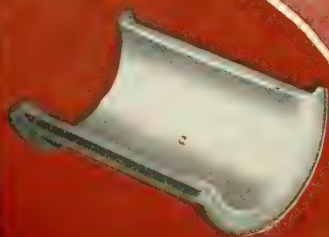
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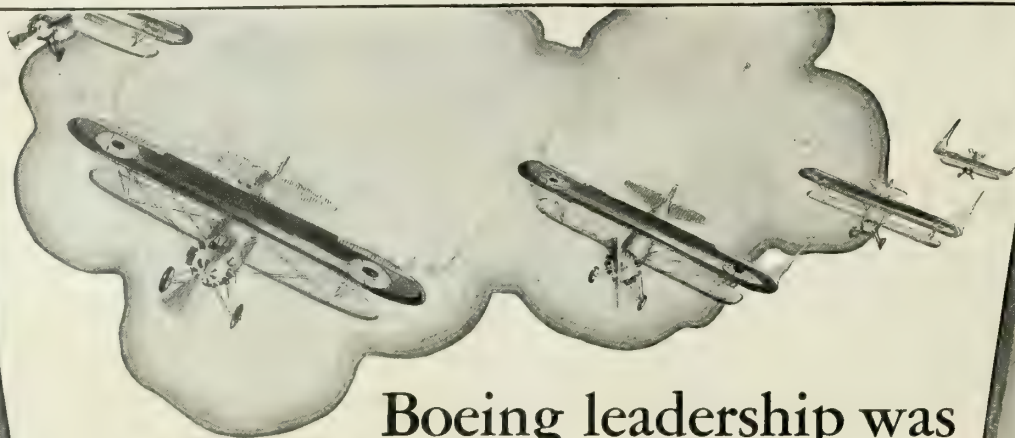
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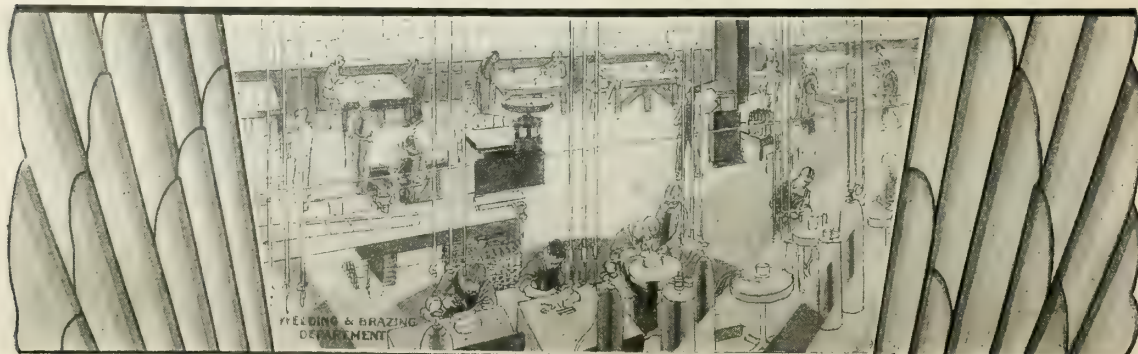


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It left only a scorch on the exterior covering and penetrated Dry-Zero approximately  $\frac{1}{4}$  of an inch.

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which resulted from the intense heat extinguished itself within a few moments after the flame was removed.



**DRY-ZERO CORPORATION**

130 N. Wells St.

Chicago, Ill.

# DRY-ZERO



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## THE FLAMINGO ALLMETAL TRANSHIP

The Allmetal Flamingo Tranship offers to the operator, private owner and pilot all the flying qualities of the old types of construction, **plus the unequalled advantages of Allmetal construction—in the same price and performance range.**

The Flamingo Tranship, a high-wing cabin monoplane, carries a pilot and 6-7 passengers; 500 lbs. mail or baggage, with 150 gal. fuel at 140 m. p. h. with "Hornet" motor and 135 m. p. h. with "Wasp" motor. Economical cruising speed of 115-120 m. p. h. Climbs 800-1200 ft. per minute. Wing span 50 ft. Weight empty, "Wasp" 2960 lbs.; full load 5600 lbs., useful load 2640 lbs., pay load 1455 lbs. Wings and fuselage covered with duralumin. Allmetal throughout including metal wings and tail surfaces. Seating arrangement optional with purchaser.

Stockholders want profits, not alibis. Managers and owners with foresight will select the equipment that offers the greatest possibilities of earning flying profits. The Flamingo is outstanding in its ability to carry heavy loads at high speeds with minimum operating costs, and to attract patronage (especially in competitive fields).

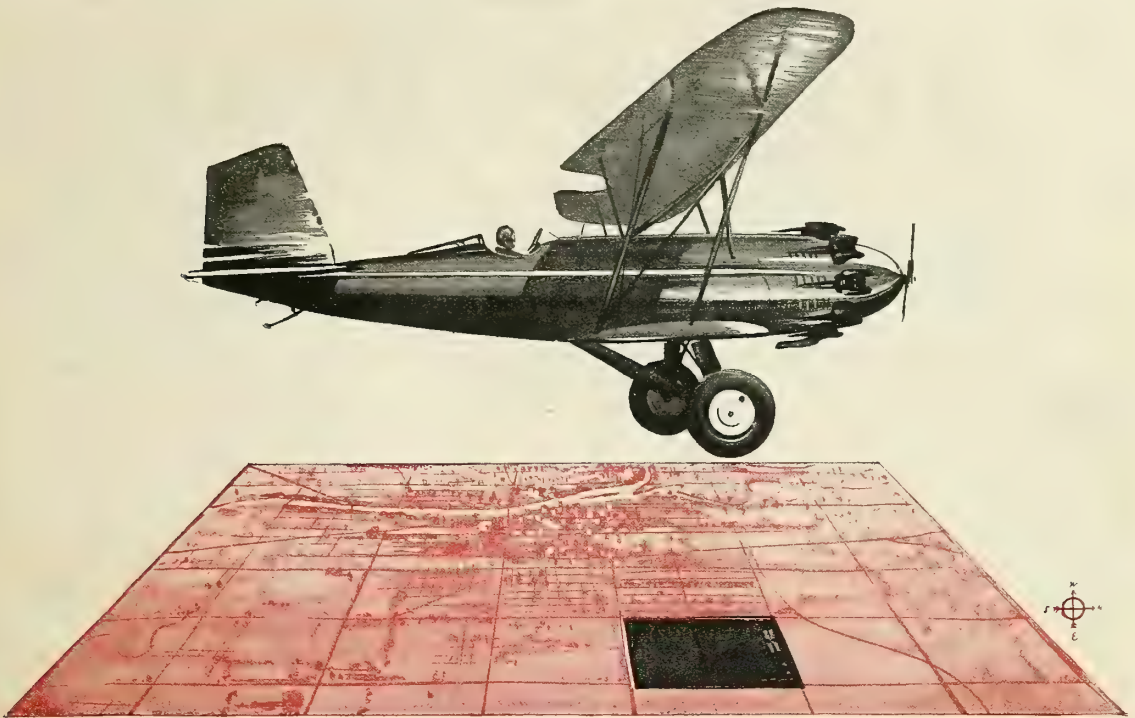
The Allmetal construction decreases three heavy items of expense by effecting lower depreciation, lower insurance and lower maintenance costs. The depreciation on the Allmetal Flamingo Tranship is only a nominal amount as the metal does not depreciate and the obsolescence factor is low, due to the advance design.

The Flamingo with all these profit earning features is Allmetal throughout, **but sells in the same price range as the old type of construction.**

Before being offered for sale to commercial operators the Flamingo has had a year's grueling service test.

[ WRITE  
FOR  
PRICES ]

THE  
METAL  
AIRCRAFT  
CORPORATION  
OF  
CINCINNATI  
MUNCKEN AIRPORT



WICHITA, KANSAS, FROM THE AIR

# PHILLIPS AVIATION

GIVES EVEN FUEL DISTRIBUTION TO EVERY CYLINDER

A Thud—a Miss—another Thud; nerve racking, engine racking, dangerous—because of uneven distribution of vapors to all cylinders. ☹ All unnecessary! Use Phillips Aviation, the super motor fuel. It vaporizes readily and completely under all conditions. Your engine starts easily at any temperature. Each cylinder gets the same mixture all the time.

Smooth, uniform performance is the result. There's more power, too, from an even hitting motor—and more speed, quicker take off, faster climb and economy of operation. ☹ Phillips Aviation gasoline is *the* fuel for "new production," high compression

motors and weighs approximately one-half pound per gallon less than ordinary Aviation Gasoline. It's used by such well known air transportation companies as Boeing, Robertson, Western Air Express, National Park Airways. Available at a steadily increasing number of airports. ☹ Ask for Phillips Aviation when in need of service.

## Phillips AVIATION

NATURAL GASOLINE FOR  
CONTROLLED VOLATILITY  
PHILLIPS PETROLEUM COMPANY  
BARTLESVILLE, OKLAHOMA



# The AVIATION MARKET

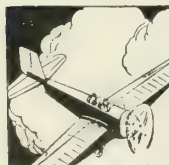
**Where it is,  
what it is,  
and WHY . . .**



Predictions indicate that there will be more airplanes produced in this country during 1929 than there will be pilots—people qualified to fly them. Thus, aviation presents a marketing problem, the solution of which is quite obviously . . . *the training of more pilots.*

★ ★ ★

To train pilots, however, there must be more and better flying schools, conveniently located in the areas that have the greatest number of prospects. And, there must be a type of training plane, which, by design, construction and proven performance, will stand the gaff of flying instruction . . . *safely and economically.*



As a solution to this problem, we offer to commercial aviation a training plane of proven merit . . . the Aeromarine Klemm, AKL25, known throughout Europe as the Klemm monoplane. In Germany, Switzerland, Norway, Sweden, Denmark, Russia, Spain, Italy, South America and South Africa, it is used extensively for training purposes.

★ ★ ★

The engineering principles embodied in the AKL25 enable it to take off and to land in the smallest and roughest of fields. Due to its



superior gliding qualities and its inherent stability, it will glide farther and with a greater degree of controllability at lower speeds than any other type of plane in existence today. Equipped with a forty horse-power Salmson engine, an AKL25 will carry two people one hundred miles on less than four gallons of fuel. Compare this economy of operation with that of planes now used for flying instruction.

★ ★ ★

If no other qualification were considered in the selection of an airplane for training purposes, the simplicity of the construction in the AKL25 would win your approval. For, there are no wires to slack, and, all parts are interchangeable. The entire plane can be dismantled and assembled by two men in a few minutes. Skilled attention is unnecessary, and maintenance is consequently at its minimum. With the wings spread ready for flight or detached for storage, the weight of an AKL25 is so distributed that one person can tow it with ease. As for performance, one demonstration will convince you beyond any possible doubt.



**Distributors  
and dealers who  
Understand . . .**

For the distributor and the dealer who understand the aviation market situation, there is an opportunity to make 1929 a most lucrative year. Because, the major market of aviation is unquestionably flying instruction . . . flying schools . . . and, the right plane for that particular purpose.



★ ★ ★



The distribution of the Aeromarine Klemm AKL25 is national in scope, and, there are still available some very desirable territories. We are interested in opening negotiations with highly responsible individuals and corporations—men who know aviation and have sufficient subscribed capital to render a genuine service.

★ ★ ★

The progress of aviation depends fundamentally, we believe, on the well-known four factors—*men, money, methods, and markets.* That is why we want *men . . . distributors and dealers . . . who have sufficient money with which to work, who have an appreciation of modern merchandising methods, and, who know the aviation market.*



★ ★ ★

If you can fulfil these qualifications, write us for details. Our franchise is liberal . . . our product is profitable . . . and, we are prepared to make immediate deliveries.

**AEROMARINE KLEMM CORPORATION**  
Paramount Building · 44th Street and Broadway · New York City

*Here is a partial list of manufacturers using Stromberg Carburetors as standard equipment:*

#### AIRCRAFT

Aircraft Engine Corp.  
The Alliance Aircraft Corp.  
Allison Engineering Co.  
Axelson Machine Co.  
Curtiss Aero. & Motor Co.  
Fairchild Caminez Eng. Corp.  
Kinner Airplane & Motor Corp.  
LeBlond Aircraft Engine Co.  
Navy Department  
Pratt & Whitney Aircraft  
Velie Motors Corp.  
War Dept.—Air Service  
Warner Aircraft Corp.  
Wright Aero. Corp.

# RECOGNITION

**135** manufacturers use Stromberg carburetors as standard equipment. This impressive list, shown here, contains representative firms in every line of industry where motors are used.

These firms **KNOW** that Stromberg superior performance is the result of the highest type of carburetion engineering, the finest workmanship, the best materials procurable.

They recognize real merit and are willing to pay for it.

#### AUTOMOBILES

Chrysler Corp.  
Continental Motors Corp.  
Cunningham Son & Co  
Dodge Bros. Corp.  
(Lincoln) Ford Motor Company  
H. H. Franklin Mfg. Co.  
Hupp Motor Car Corp.  
Jordan Motor Car Co.  
Locomobile Co. of America, Inc.  
Marmon Motor Car Co.  
Peerless Motor Car Co.  
Pierce-Arrow Company  
Sayers Scoville Co.  
The Studebaker Corp.

#### MARINE

Consolidated Ship Bldg.  
Sterling Engine Co.

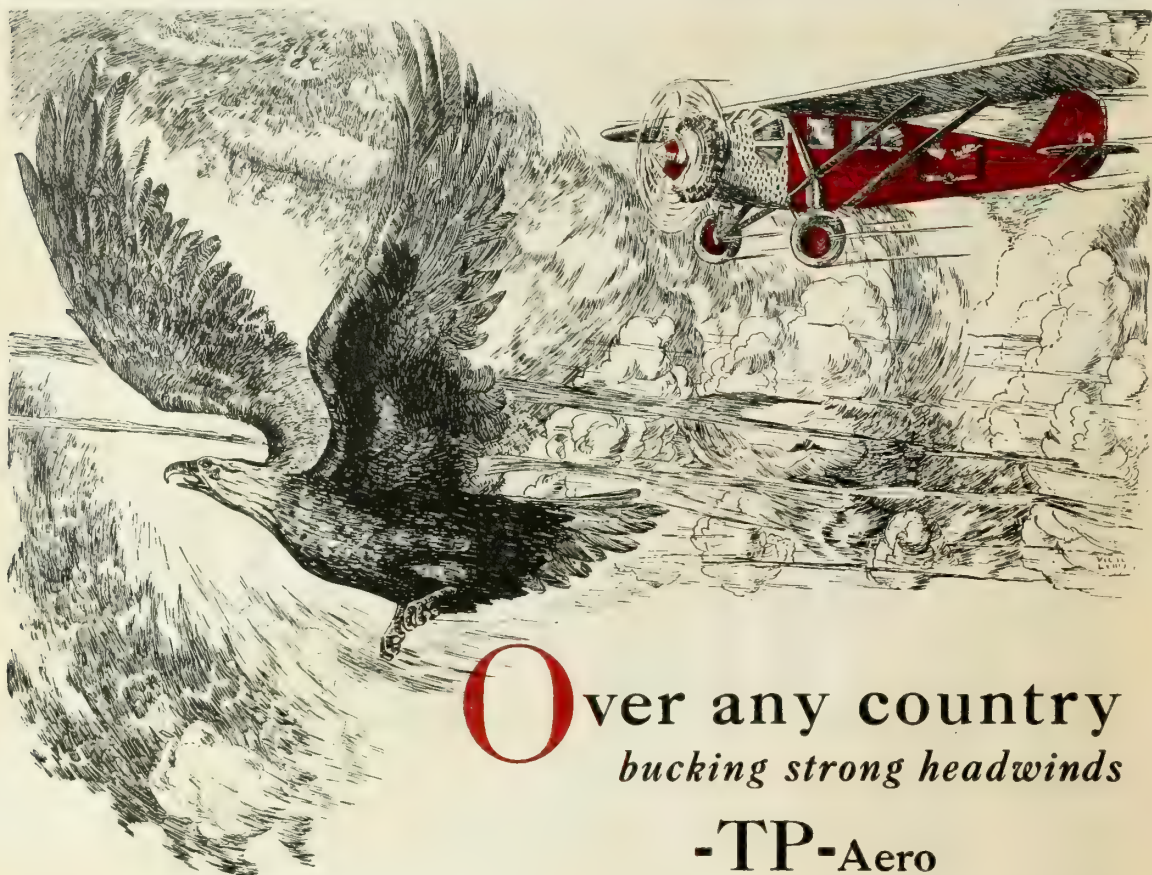
#### TRUCKS, TRACTORS, ETC.

Aeme Motor Truck Company  
The Autocar Company  
Brockway Truck Co.  
Climax Engineering Co.  
The Four Wheel Drive Auto Co.  
Graham Bros.  
Hercules Motor Corp.  
Indiana Truck Corp.  
International Motor Co.  
International Harvester Co.  
Le Roi Company  
Lima Locomotive Works  
Maccar Truck Co.  
Minneapolis Steel & Mach. Co.  
Minneapolis Threshing Machine Co.  
Sanford Motor Truck  
Schramm, Inc.  
Selden Truck Co.  
Stewart Motor Corp.  
Waukesha Motor Co.

See Our  
Exhibit  
at the  
Aircraft Show  
Detroit  
April 6th to 14th

**STROMBERG MOTOR DEVICES CO., 58-68 E. 25th Street, CHICAGO**





**O**ver any country  
*bucking strong headwinds*

**-TP-Aero**  
*protects your motor*

-TP- Aero, the Original and only all paraffin base ZERO POUR TEST oil, will keep its fluidity as low as 40 degrees below zero. **This is a straight run and not a blended or compounded oil.** Its wax free feature is responsible for its low cold test as well as its outstanding fluidity at extremely low temperatures. It also holds its viscosity at extremely high motor temperatures. It is an entirely new oil, made especially for aircraft motors. If your dealer cannot supply you, advise us.

{ Have you tried -TP- Aero Rocker Arm lubricant, a low cold test pure paraffin base mineral oil product? }

*free—*

Pilot's Log Book, 36 pages of blank forms with handsome durable cover. Free to you—send the coupon.



Patent Pending

**TEXAS PACIFIC COAL & OIL CO.**

New York

Fort Worth, Texas  
St. Louis

Los Angeles

Please send me, without obligation, your Pilot's Log Book described above.

Name..... Address .....

City.....

State..... Your Oil Dealer's Name.....

AD3

# SMOOTH POWER



**KINNER  
AIRPLANE MOTORS**

**5 CYLINDER  
100 HORSEPOWER  
APPROVED TYPE  
CERTIFICATE NO. 3**



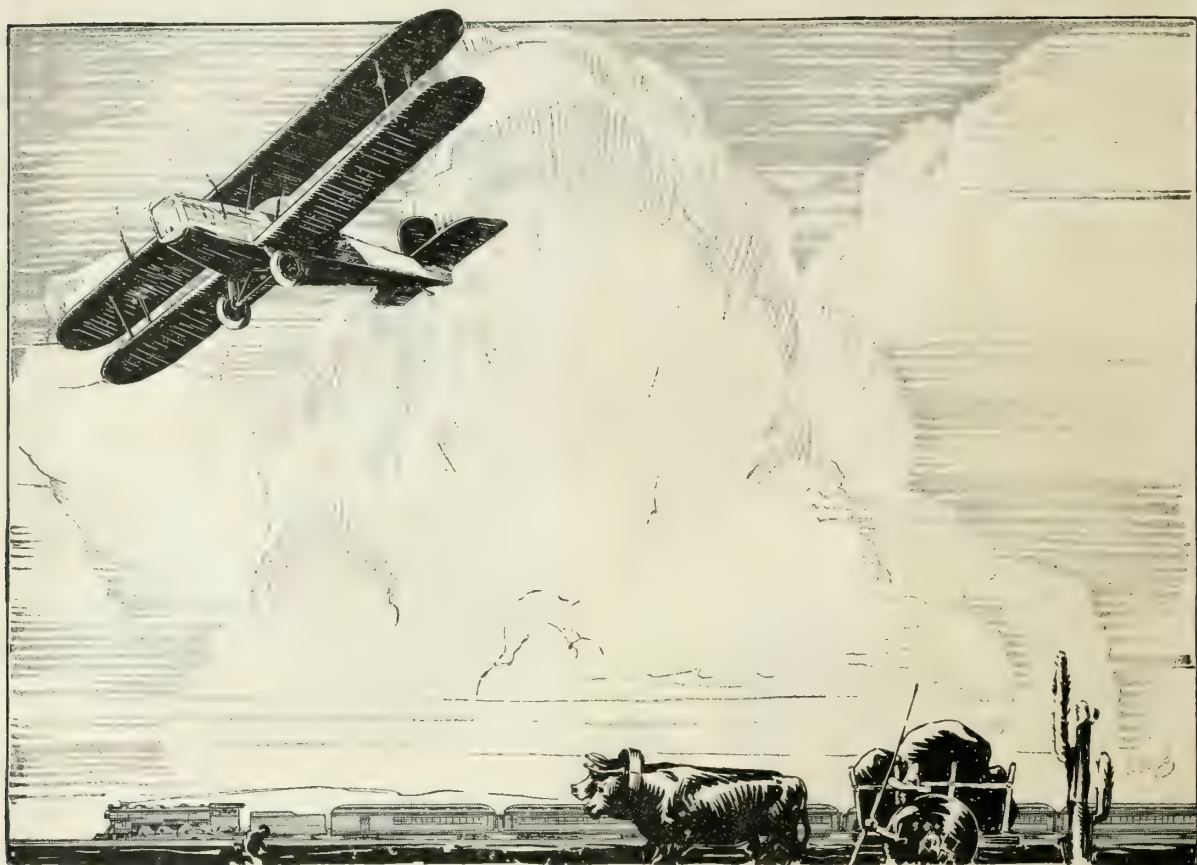
**KINNER AIRPLANE AND MOTOR CORP. GLENDALE, CALIF.**



FIRST AROUND



THE WORLD



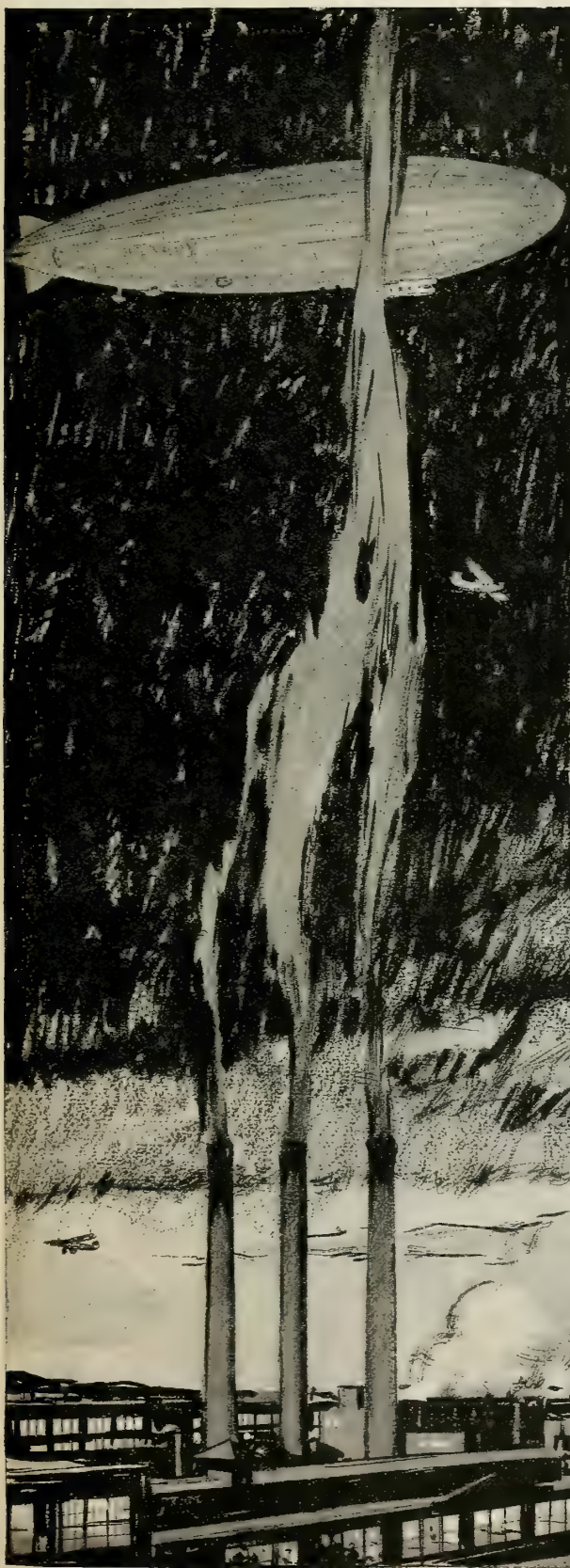
*O*XEN straining at the yoke, fighting with superlative, yet almost hopeless effort for every foot of ground gained by creaking, moaning wheels... alongside rushes a smoke-belching giant, possessed of the strength of a thousand oxen, speeding over endless outstretched roads of shining steel... and up above... the drone of a Douglas Plane.

Old Mexico accepts the new. Unconsciously it concentrates in this one scene a graphic portrayal of the evolution of transportation... it illustrates the progress made by man through the ages in his ceaseless fight against time loss.

In this modern age, economic pressure demands time-saving speed. Douglas heeds the need with planes soaring over great air mail routes transporting precious payloads of men and mail to far distant cities. But speed, alone, is not enough!

Douglas couples speed with safety. Into each Douglas plane is bred a degree of stamina that assures successful flight. Master craftsmen, aided by quality materials, build into each plane superior strength that asserts itself in emergency, and gives to the pilot a true realization of the meaning of the words... *Douglas Means Dependability.*

DOUGLAS  
AIRCRAFT CO.  
INCORPORATED  
*Santa Monica California*



## Look to Goodyear

Goodyear has always been air-minded. The history of Goodyear participation in aerial science parallels the development of the industry.

Here at Akron we have a large and veteran department devoted to the improvement of Goodyear's service to all types of aircraft. Here, there is available to you accurate data on airplane tires and other rubber equipment; here is the seat of America's lighter-than-air authority.

And all of this experience is available to you men who design, build, or operate aircraft. Look to Goodyear—any question, any suggestion, will get prompt attention here. Write, wire, telephone, or come personally.

*Aeronautics Department*

GOODYEAR, AKRON, OHIO,  
OR LOS ANGELES, CALIFORNIA

EVERYTHING IN RUBBER FOR THE AIRPLANE





## PORTERFIELD TRAINING IS YOUR GREAT- EST ASSURANCE OF EARLY SUCCESS

Every phase of Aviation is vitally important. The industry must have properly trained specialists. Your choice of an Aviation school, therefore, is a vital decision. You must choose a school which gives you the type of training the industry demands. Porterfield Flying School offers you advantages to be found in no other civilian school. We give you thorough training in the genuine atmosphere of the industry. Our classrooms are the shops and field of one of America's leading aircraft manufacturers. Our instructors are experts who are active leaders in the industry and our equipment is the best available. Porterfield courses from the beginning have conformed strictly with the requirements recently announced by the Aeronautical Chamber of Commerce. Our instruction has been designed to meet the specific demands of aircraft manufacturers and operators. That is why Porterfield students are making good in the industry and that is why the industry places its confidence in Porterfield students who have taken advantage of the splendid opportunities offered them in their early training.

*Complete  
Theoretical  
and Ground  
Training*

*Thoroughly  
Modern  
Planes and  
Equipment*

PORTERFIELD FLYING SCHOOL, INC.,  
1435 Grand Avenue, Kansas City, Mo.

I want complete information about your expert training which will assure me success in commercial aviation. Please send me "A Flying Message."

Name ..... Age .....

Street .....

City ..... State .....

# PORTERFIELD FLYING SCHOOL

*Kansas City, Missouri*



## QUAKER STATE-MENTS

**I**T WILL be well for thee to know—there is an extra quart in every gallon of Quaker State Aero Oil. This, my friend, is not merely an advertiser's boast, but the very truth. Let me explain it to thee. This oil is subjected to a special process of refining, beyond the point where the refiner ordinarily leaves off. By this process a quart or more of material that has little or no value in thy airplane motor is removed from each gallon of oil; and so, instead of the usual quart of waste in every gallon, thee gets *four* full quarts of lubricant—an extra quart!

Moreover, this oil is made only from 100% pure Pennsylvania Grade Crude, the value of which is twice to three times as much as that of the Crudes from which most oils are made.

Many good pilots have given testimony to their great satisfaction with this oil; so, to assure thee of getting it in all thy travels, the refiner has established more than 500 distributing warehouses, and engaged 80,000 dealers to serve this continent, and thee, from Coast to Coast.

## QUAKER STATE AERO OIL

QUAKER STATE OIL REFINING COMPANY  
Oil City, Pa.



*Other Pure Pennsylvania Products are:*

Quaker State Medium Motor Oil  
Quaker State Heavy Motor Oil  
Quaker State Cold Test Oil  
Quaker State Tractor Oils







## THE *Engines*

*Chocks are away! In the teeth of a gale  
That whips through the stays with a trumpet's blare,  
And up where the cloud-dimmed dawn is pale  
The swift blades swish in a silver glare.  
Aloft and alone, in a sky swept bare,  
They flash through the sun's bright aureole  
Off into space and a dim somewhere,  
As the engines rumble and roar and roll.*

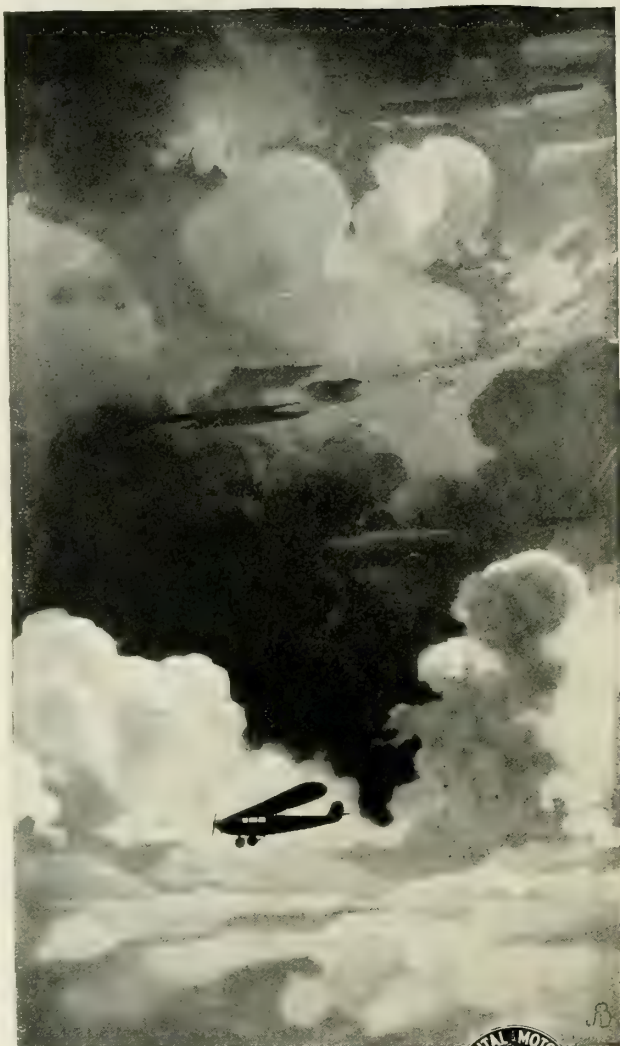
*Let the earth slide down and the vision fail,  
And the murky mists come unaware;  
Let the wild winds whimper and whine and wail;  
These are the things that the airmen dare.  
They ride with a confidence debonair,  
Swiftly winging their lone patrol.  
What price weather? It's always fair  
When the engines rumble and roar and roll.*

*Then with nose shoved down and fabric frail  
Shrieking and singing, they madly tear  
Back from the skies with a fresh-won tale  
Of conquest anew in the vast "up there;"  
A man and a motor, valorous pair,  
Safely and surely they gain their goal:  
And so goes the story everywhere  
When the engines rumble and roar and roll.*

### L'ENVOI

*Prince of the Heavens, wheresoe'er,  
You ride your skies from Pole to Pole  
A toast to his Majesty, King of the Air,  
"To the engines that rumble and roar  
and roll."*

—William Kimball Ziegfeld



*ALONE* — what boundless satisfaction to those who venture the air's uncharted ways is the knowledge that Continental Motors Corporation, the world's foremost authority on gasoline motors, as well as its largest producer, has perfected the development of a complete line of airplane engines . . . no longer alone is he who guides these ships of the air . . . together with a welcome brother . . . confidence . . . he rides the skies.



*Continental Airplane Engines will be exhibited at the All-American Aircraft Show, Detroit, Michigan, April 6 to 14, 1929*

CONTINENTAL MOTORS CORPORATION  
Offices: Detroit, Mich., U. S. A.      Factories: Detroit and Muskegon  
The Largest Exclusive Motor Manufacturer in the World

# *Continental Motors*

"The Lindbergh of China," General Chang Hui Chang, shaking hands with Mr. Paul Jernigan of the Peking office of the Standard Oil Company of New York.



## General Chang blazes air trail across China . . . . WITH SOCONY

THE "Spirit of Canton," piloted by General Chang, recently completed the first flight across China.

Socony contributed to this triumph, for Socony Aviation Gasoline was used in the 1,000 mile flight from Canton to Moukden and return.

In New York and New England, too, Socony Aviation Gasoline leads in popularity. Aviators, like thousands of motorists, have discovered for themselves the dependability and availability of Socony products.

# SOCONY

REG. U.S. PAT. OFF.

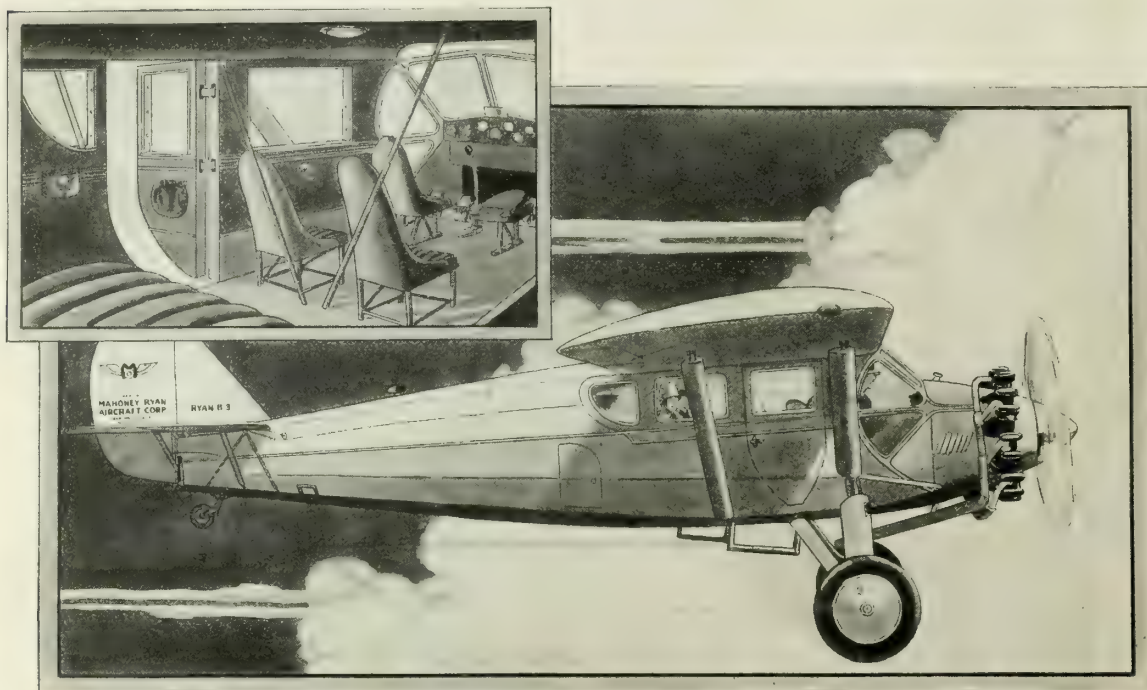
**AVIATION GASOLINE  
AIRCRAFT OIL**

**STANDARD OIL COMPANY OF NEW YORK**

Say you saw it in AERO DIGEST

*When flying in the Southwest, use the products of Magnolia Petroleum Company, and on the Pacific Coast standardize on the products of General Petroleum Corporation. These are two important subsidiaries of Standard Oil Company of New York.*





# NEW!—Through and Through!

*"An unequaled bad-weather ship," say veteran pilots  
of the new Ryan Brougham for Six*

—And a fair weather ship beyond comparison, too—is this new Brougham, the most beautiful ship and the greatest performer Ryan ever built. The new Ryan represents the happy medium—speed, stability, maneuverability, and now perfected coachwork design puts it in a class with the finest motor cars.

"Inherent stability" is no longer an empty phrase. It is the verdict of every pilot who has flown this brilliant ship. "Hands off" flight is now commonplace—here is a ship which, properly balanced, will keep constant altitude at any engine speed . . . will recover automatically when the gun is cut . . . has directional stability, even at stalling speeds.

"Red" Harrigan, Ryan Chief Test Pilot, will tell you—and show you—it is the best balanced ship in America today. Pull the nose high in a stall and you will experience no falling off. If conditions demanded, this balanced ship could be flown and landed with the stick alone, or with only the rudder and stabilizer. *These vital qualities reach their biggest development in the Ryan.*

Exterior attractively paneled—interior in the best taste in coach design. Individual middle and control seats . . . comfortable for cross country trips. New controls give an absolutely clean floor . . . nothing to jam or catch . . . easy brake control . . . the ultimate in comfort and security.

This sure-winged Brougham is designed for first-class commercial air travel and is well adapted to special speed trips of business executives. *It takes off faster and lands slower than any other plane of its type.* The substantial performance given by the B-3 model with the Wright J-5 motor is amplified to an astounding degree in the B-5 model with the Wright J-6 motor.

*Created by a substantial company which built and sold more Whirlwind cabin ships in 1928 than any other maker.*

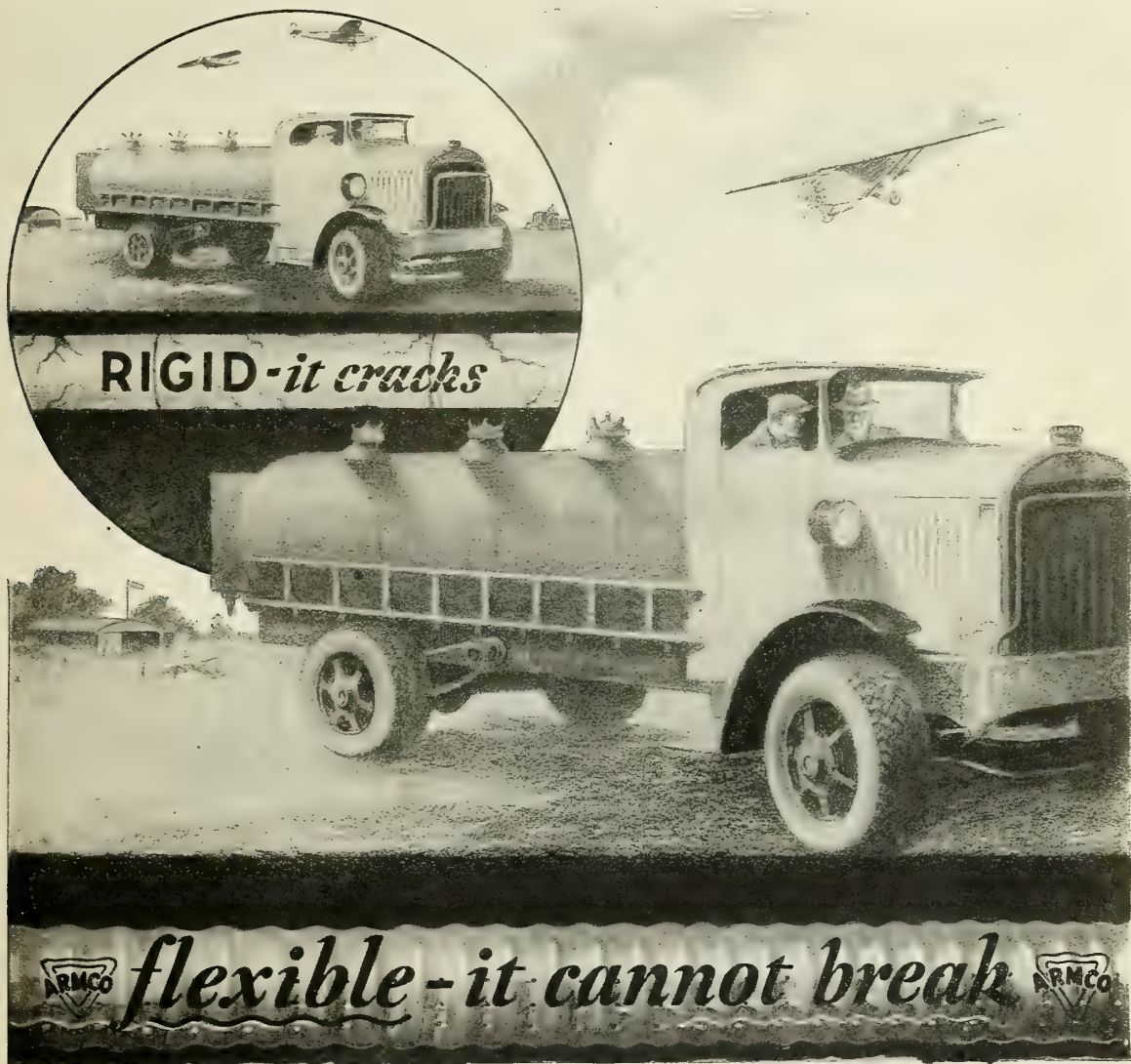
Ships of this new model are ready for early delivery through Mahoney-Ryan distributors situated at the leading airports throughout this country and abroad. Illustrated four-color brochure giving full description will shortly be available to interested individuals and corporations.

*The* **MAHONEY - RYAN AIRCRAFT CORP.**

Lambert-St. Louis  
Airport



Anglum, St. Louis County  
Missouri



**RIGID-it cracks**

**flexible-it cannot break**

**Bumping trucks—crushing rollers—speeding planes—  
here is a drain that carries them all safely**

**A**IRPORTS offer an exacting test for sub-drains. The drains must be unfailing in their operation to prevent dangerous depressions or soft spots—safety is the first essential of airport construction.

But in addition, the drain must endure the severe impact, loads of gasoline trucks, rollers and landing airplanes.



(The U. S. Department of Commerce estimates heavy modern planes land with 10-ton force on each wheel.) Armco perforated iron pipe provides a satisfactory and certain solution. Years of use have shown it to be safe under conditions which would crush rigid pipe. Write for complete details.

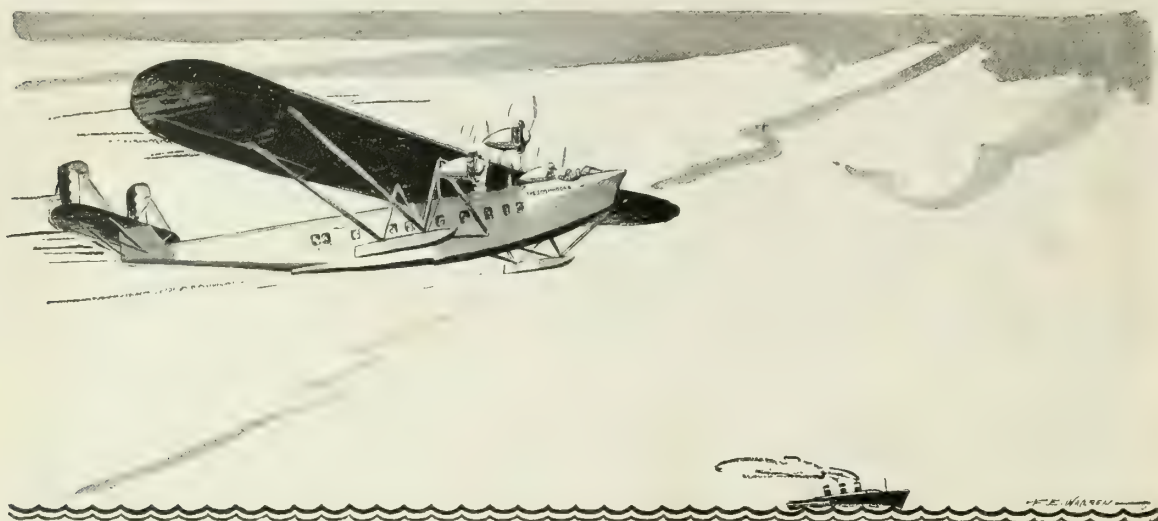
Armco culverts and drains are manufactured from the Armco Ingot Iron of The American Rolling Mill Company and always bear its brand

ARMCO CULVERT MANUFACTURERS ASSOCIATION, Middletown, Ohio

# ARMCO *perforated* PIPE

*Use flexible pipe—it cannot break*





## ON *the* HIGH-WAYS *of the* SKY...

... up and down the coast ... over harbor, lake and river ... above mountain, plain and valley ... throughout the Western Hemisphere, the aerial carrier plies its course—winging its way night and day in the service of mankind. Cities and towns with the better terminal facilities—both land and water—are bound to receive the balance of trade, just as the transport operator who is better equipped to serve these communities will enjoy the maximum revenue. Competition in the air, even today, demands superior equipment—planes that carry increased pay loads, cover greater distances and comply with the imperative needs of safety and speed. The Commodore, the sister-ship of the

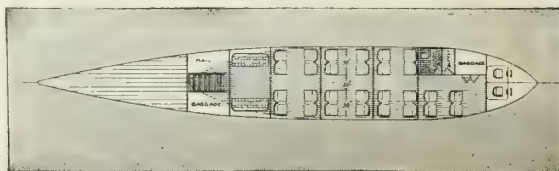


Sectional view of passenger compartment

Consolidated patrol plane XPY-1 which won the Navy's contest of 1928 for the most efficient general-purpose, heavy-duty flying boat, has been designed to cope commercially with aviation's advanced and advancing needs. The Commodore is a modern Leviathan of the air, with comfortable and commodious accommodations for thirty-two passengers, in addition to baggage, mail and express compartments. To co-operate with established air transport operators, individuals or organizations contemplating a commercial service, we will gladly furnish facts and figures—a complete survey showing how. The Commodore fulfils in every way the growing needs of commerce on the high-ways of the sky.

CONSOLIDATED • AIRCRAFT • CORPORATION • BUFFALO NEW YORK

The Commodore is an all-metal constructed, internally braced, monoplane with a wing span of 100 feet and an overall length of 60 feet. It can land and take-off in a heavy sea, if necessary. Three "Wasp" engines furnish the power—high speed 130 m. p. h.—cruising speed well over 100 m. p. h. The control cockpit is in the nose of the hull, connected to the main cabin by a door. The main cabin consists of five separate compartments, as illustrated. Each compartment has its own ventilators. The seating arrangement is such as to permit one double berth on each side of three compartments, thus affording sleeping accommodations for twelve persons. Space is available under the



seats for life preservers, and two hatches are provided in the deck for emergency. The interior decorative scheme of the passenger compartments is optional. Seats are upholstered in mohair or velvet to match the interior trim, and the metal flooring in the cabin is carpeted. Complete accommodations are provided for a steward.

# *The* COMMODORE



**"USE THE AIR SERVICE"**

**C**ITIES are awakening to the need for airports and real air terminals. While many landing fields may be found, there are but few modern airports in the United States today. The aeronautical future of a city depends upon wise guidance in providing adequate and proper airport facilities.

With more than 10 years experience in all branches of the aviation industry, Austin offers the following:

**Complete Airport Service**—preliminary surveys and reports, engineering surveys and studies, site selection.

**Design and Construction**—grading, drainage, lighting, all necessary airport buildings such as administration buildings, hangars, repair shops, etc. Also aircraft factory buildings.

Ask for booklet, "Airports and Aviation Buildings"

## THE AUSTIN COMPANY

Airport Engineers and Builders      Cleveland  
New York, Chicago, Philadelphia, Detroit, Cincinnati, Pittsburgh,  
St. Louis, Seattle, Portland, Los Angeles, San Francisco, Dallas



Memo to THE AUSTIN COMPANY, Cleveland—

We are interested in a ..... project containing ..... sq. ft. Send me a personal copy of

☐ "Airports and Aviation Buildings"    ☐ "The Austin Book of Buildings"

Individual .....

Firm .....

City ..... State .....

AD 3-29



SAFEST

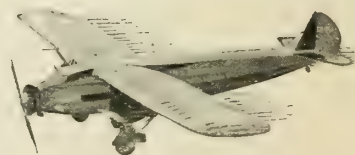
- SWIFTEST

- LARGEST



KEYSTONE PATRICIAN

## Now touring the country— this GIANT OF THE AIR!



THE PATRICIAN, Keystone's great tri-motored Transcontinental Air Liner, is flying the airways of the country on a tour of demonstration from the Atlantic to the Pacific and return. Stops are being made at numerous airports along the way. Courtesy flights are being given to transportation executives, city and state officials, business men and others so that all may witness the unmatched

Upper—Luxurious Main Cabin of the Patrician  
Lower—Convenient Entrance to the Patrician







performance of this great 20-passenger monoplane transport.

Watch the newspapers for the arrival of the Patrician in your locality. Plan to see and to fly in the largest, safest, swiftest, overland transport—the master product of the Keystone Aircraft Corporation, leading producers of multi-engined planes.

The Patrician will be installed in regular operation on several important transport lines this summer. A production schedule is now under way.

*Follow the tour of the Patrician!*

### SPECIFICATIONS • KEYSTONE • PATRICIAN

<i>speed</i> 151 m p h 	<i>20</i> <i>passengers</i> 	<i>payload</i> 3880 lbs 	<i>ceiling</i> 17400 feet 
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# KEYSTONE

KEYSTONE AIRCRAFT CORPORATION

*Sales Dept.*—31st Street and East River, New York

*Plants*—Bristol, Penna., and New York City





COPYRIGHT 1929 BERRY BROS.

# STINSON and *Berryloid*

The colorful Red-start inspired the marking on this Stinson.  
Striking color harmony is achieved with International Orange,  
Moleskin Deep and Diana Cream.

The  
Berryloid  
Fleet

NUMBER  
ONE





EDWARD A. STINSON, President  
HENRY C. HUND, Vice President

EDWARD F. EVANS, Chairman of the Board

WILLIAM A. MARA, Secretary  
RICHARD FITZGERALD, Treasurer

## STINSON AIRCRAFT CORPORATION

DETROIT, MICHIGAN

January 8, 1929

Berry Brothers, Inc.,  
211 Leib Street,  
Detroit, Michigan.

### Attention Aviation Division

Gentlemen:

Of the scores of Stinson planes finished during the past three years in Berry's dope, Aircraft Berryloid and Lionoil, very few of them have yet required recovering. Your products and excellent service have given us great satisfaction at all times and we shall continue to use Berry finishes in our new factory now under construction.

With the additional equipment and space available in our new dope and paint department we anticipate that the new production Stinson planes shall emerge even better finished than those of previous manufacture.

Your close co-operation with us in finishing problems has always been appreciated.

Very truly yours,



Edward A. Stinson, President,  
STINSON AIRCRAFT CORPORATION.

EAS:MP

**"Eddie"  
Stinson  
writes—**

When manufacturers standardize on Aircraft Berryloid products their finishing troubles are ended. Airplane builders are urged to refer all matters regarding exterior trim or protective coating of their ships to the Aviation Division. Experts in this department will provide a prompt solution of any difficulty.

PROGRESSIVE - AIRCRAFT - FINISHES

**BERRY BROTHERS**  
Varnishes Enamels Lacquers  
Detroit Michigan Walkerville, Ont.





# I'm not afraid of lions!

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Volume 14  
No. 3

# AERO DIGEST

MARCH  
1929

THE MAGAZINE OF THE AIR

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Cover Design—The Stearman Speed Mail Plane

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Frank A. Tichenor, President.

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George F. McLaughlin, Editor.

Robert B. Renfro, Associate Editor.

William A. Rogers, Advertising Manager.

Contributing Editors: Dr. Michael Watter, Cy Caldwell, Don Rose, Edgar H. Felix.

### BRANCH OFFICES:

BOSTON: 80 Boylston Street. Henry C. Pragoff, Representative. Phone: Hancock 8915 & 8936.

CHICAGO: 720 Cass Street. L. F. McClure, Representative. Phone: Superior 2802.

CLEVELAND: 915 Guarantee Bldg. Robert P. Smith, Representative.

KANSAS CITY: 307 Interstate Bldg. J. Hal Miller, Representative. Phone: Victor 1713.

LOS ANGELES: 1129 Mohawk Street. Frank Samuels, Representative. Phone: Dunkirk 6332.

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*Underwood & Underwood*

*Capt. Hawks flying the Lockheed Air Express in which he made the California to New York non-stop flight in 18 hours and 22 minutes*

# OUR COAST-TO-COAST FLIGHT

ORIGINALLY there was no thought of a non-stop flight.

There was to be only a mutual service between the Lockheed Aircraft Corporation and myself. They wanted to send back east the "Air Express" model equipped with the new N. A. C. A. cowl. I wanted air transportation in preference to the railroads. They could provide me a quick trip, and I could save them some expenses. So upon this basis, the epoch making non-stop emanated and I began my preparations.

Two days later I was asked if there would be any objections to loading in some 300 gallons of fuel and making a non-stop via daylight to Chicago. I assented to such arrangement providing there would be no advance publicity given. Realizing the time of the year offered no definite certainties concerning the weather, I preferred to try the undertaking quietly. If successful, we could then broadcast our success; if forced down by the unfavorable elements, I would be merely delivering a new "Air Express" model to Chicago. Upon this premise arrangements were made.

The next day Mr. Byron Phillips of the Texas Company, at Los Angeles, made an expression that it seemed a shame we did not make the coast to coast non-stop in an endeavor to lower the record established by Art Goebel last August. I was willing to try, and upon a consultation with Mr. Ben Hunter, vice president and general manager of the Lockheed Aircraft Corporation, it was decided to proceed on the Los Angeles to New York flight. I must say here that the Lockheed people are great sports.

Prior to February 4th, tests were conducted. Several trips were made to San Diego to test the ship's cruising speed, the gasoline consumption, the compasses, performance, and motor cooling with the new cowl. On one of these flights we secured the precious Carograph from the Navy, who were most generous in their coöperation with us.

In addition to making actual test flights, I was secur-

*An Account of the Record-Breaking Non-Stop Flight,  
Written Especially for  
Aero Digest*

By  
**Frank M. Hawks**



Frank M. Hawks

the entire organization of The Texas Company for the efficient help rendered in my behalf.

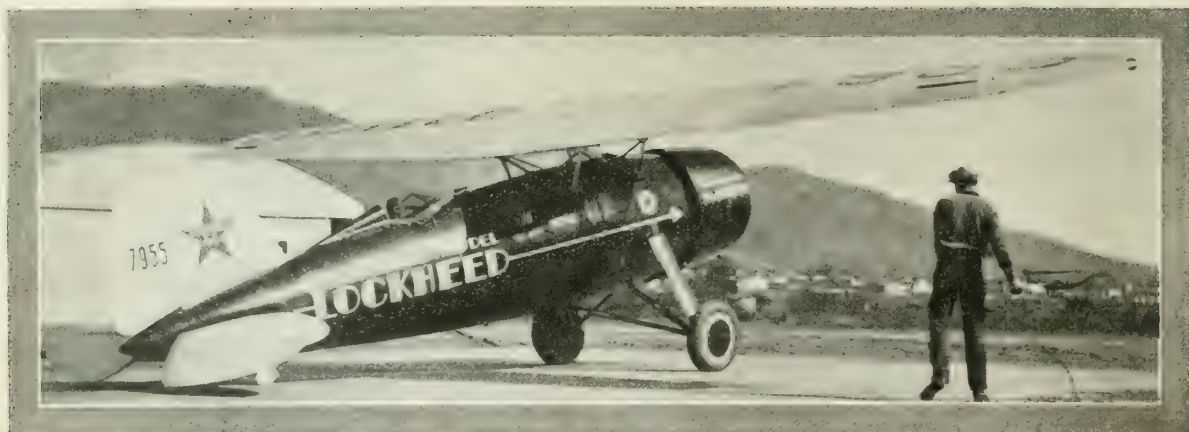
With daily weather data, I could see how the various low and high pressure areas were acting. These guides aided me in deciding upon Monday, February 4th, as the date to hop off on the venture. On that day, a final check came from all our good folks by direct telephone calls. Up to within one-half hour before we roared down the runway, I received advices on the weather conditions. The deciding factor was clear weather over the section where I was to fly at night. A last minute report of bad weather in the vicinity of Oklahoma City prompted me to delay my take-off hour from 4:00 p. m. to 5:30 p. m. in order that another hour and a half of the night part of the trip would fall farther west where weather was clear.

While I was busying myself with the weather picture over the country, Mr. Oscar Grubb, superintendent of the final assembly of the Lockheed Aircraft Corporation, was attending to the loading of the ship with the fuel. He was most thorough and not a detail was overlooked. The main tanks were filled with 100 gallons of our Texaco aviation gasoline. Then 75 five-gallon tins were carefully packed into the cabin. This gave us a total of 475 gallons of fuel. The oil tanks were filled to their capacity of twelve gallons of Texaco airplane oil No. 4 and in addition an extra ten gallons of this oil was carried in the cabin in one-gallon tins. There wasn't any more room for five-gallon tins. Two canteens of water, a thermos bottle of coffee, and a few sandwiches were also packed in the cabin. The parachute



Hawks taking off from Los Angeles Metropolitan Airport on his non-stop flight to New York





Frank Hawks in the Lockheed Air Express Model at Los Angeles before his flight to New York.

flares (for forced landings at night) were carefully installed and inspected. Everything was in readiness. Mr. Grubb's part was perfectly played. We were ready.

I remained at the tower office of the Los Angeles Metropolitan Airport with an old time friend, Mr. Waldo Waterman, who is the airport manager. He was doing everything in his power to help us. Since the field was a little soft, he cleared the apron in front of the hangars which was solid. This gave me a run of about 4,000 feet directly into the wind.

It was now nearing 5:30 p. m. Pacific Time, and the sun was rapidly disappearing over the horizon. The motor was being warmed up by Mr. Soderling, the Pratt & Whitney representative who had given our 420 h. p. Wasp a thorough check and his official O. K. I left the tower and Waldo drove me slowly down the runway for a final inspection. Then we returned to the ship, the motor of which was lazily idling with a steady "tick-a-tack" which spelled reliability and power to me. Really for the first time I was thrilled, not so much for the adventure before me, but the thought of the complete coöperation being given both by those at the airport, by the motor people, the airplane factory, and last but not least my own family, The Texas Company. To think that all these agencies were putting their shoulders to the wheel unselfishly just so two pigmy men could fly across the United States! It was a thrill for everybody connected with the flight from truck driver to President, from mechanic to technician, and I was grateful to be the recipient.

Mr. Grubb and I now were all bundled up,—he in a flying suit, and I in a heavy raccoon coat. The last precaution to be added was the parachutes. We were prepared to jump if forced to land with our heavy load at night in the mountains or under some blind condition such as fog, sleet or snow.

After stuffing Grubb in the cabin where his task had now really just begun, I climbed into the open cockpit behind. I revved the motor up with blocks under the wheels to make sure it was developing full

power. The blocks were then pulled, we waved "Good-bye" to all our friends who believed in us and to the gathering of curious people who were wondering if such a flight were possible. Then I opened the throttle, and slowly gathered momentum with our load. After a run of 2,000 feet, we were off the ground and slowly climbing. I kept the ship straight for about a mile and then turned around heading southeast to cover the first leg of the great circle course to New York.

We were not up ten minutes when darkness befell us, and from then on my navigation problem was to be complicated. In about 45 minutes we passed San Bernadino, California, and drawing near the first mountain pass over which we must drag our heavily laden plane. By the time I reached Bauning, Calif., I had 6,500 feet altitude and was able to go over the top with about 1,500 feet to spare. There were some clouds to bother me but I weaved around through them and was able to keep forward visibility.

Through the first ridge, all clouds disappeared and we were facing the desert regions. Beautifully clear was the atmosphere, and the stars seemed as big as buckets. Soon we passed about twenty miles north of Tucson, Arizona, and we were flying at an altitude of 12,000 feet and steadily climbing. I had the motor running at about half throttle now.

Another hour and I was supposed to be passing near Clifton, Arizona, where a bonfire was to be burning for guidance. At this point we were flying at 15,000 feet. I could see no fire and had to guess between several clusters of lights which might be Clifton. My course now was changing on the circle, and I was flying east northeast or about 70 degrees. The next fire to be picked up was Roswell, New Mexico. This I was able to see at a long distance so I altered my course to about 60 degrees passing

to the north of this point in an endeavor to cut off a corner or two. Here the clouds began to thicken under us, and from Roswell on through the night we never saw the ground again. The beacon fires, which



Hawks' plane upon its arrival at Curtiss Field, Long Island.

(Con. on p. 218)



# WHAT! NO SAMPLES?

By Don Rose

I SPENT the last three or four weeks at the New York Aviation show. Maybe it wasn't three or four weeks.

The fifteen-cent catalog and directory of the performance seems to think the show lasted no more than a week, but you know how it is with exhibitions. The exhibitors, demonstrators, and inveterate addicts like myself, who must live and move and have their being on the exhibition floor all through the show, lose all track of time in the ordinary sense of the word and enter into a sort of Fourth Dimension in which time is measured entirely from one ham sandwich to another. The New York Show began on February 6 and lasted for 89 ham sandwiches.

I haven't been to a New York Aviation Show for years. One reason for this is that there hasn't been a New York Aviation Show for years, or even longer. There seem to have been doubts and apprehensions among the show-minded people as to whether New Yorkers could be aroused and interested by an aviation show. The typical New Yorker is approximately related to the ground hog or prairie dog and spends his life diving in and out of subway holes, and someone took a long chance in trying to interest him in the air and its airways. But the Aviators' Post No. 743 of the American Legion went through with it and got away with it. Over 175,000 cash customers got by the gate during the week, and there were a couple of evenings when Grand Central Palace couldn't have held any more without splitting at the seams.

What did they all come for? Well, I didn't ask them particularly, but it looks as though some of them came to buy airplanes and similar trifles. At half-past the third sandwich on the last day of the show, I went looking for the management, Messrs. Anderson and Parsons, to get facts and figures with which to enlighten my public. I never did find the management, but I found the management's third assistant or thereabouts, and he showed me that about four million airplanes had been sold at the show during the week. Maybe it wasn't four million airplanes; maybe it was just four million dollars worth of airplanes. But anyway it was a lot of airplanes.

By the time the show was over practically every plane on the floor—with the exception of Mr. Levine's All-Metal Cruiser—had a "Sold" label hanging on its nose. Mr. Levine's baby wasn't for sale, so far as I could find out, and he wouldn't even raffle it. But the rest of them had all found new homes and masters. Some of the exhibitors had sold the same ship three or four times; some had sold out production until 1931; some had quit selling altogether and were playing a little bridge in the gents' wash room. Doc LaRoe had sold all the Eaglerocks he could get and some that he couldn't, and when I saw him, had just made a deal with a man from Ohio for a third share in Grand Central Palace itself. Before I left he had sold all the plumbing in the Palace to a Kansas man, and was offering choice building lots on Park Avenue. It was a great show for business.

The show was just stuffy with air-minded prosperity. The flying schools were getting their share, and when I paid my official visit to the Roosevelt outfit, they had signed up 1,499 new prospects and were resting easily. I signed up myself to make it an even 1,500, and then went and did likewise by the other flying schools in the show so that there wouldn't be any hard feelings. In fact, I was one of the show's best customers. I took demonstrations on anything that was offered, from seaplane floats to avia-

tion spars, and from Neon lights to all-metal hangars. Everywhere I went I got my money's worth, with all kinds of

patience and politeness thrown in. For instance, there was the Eclipse Starter exhibit. The gentleman in charge worked over me for half an hour or more. I stood there with an interested expression on my air-minded countenance and said "Ummm," and "Uh-huh" at the proper places, and he gave me the whole works. The only thing he didn't give me was samples.

That was the only thing wrong with the show. There were no samples. This seems to be the fundamental difference between an aviation show and every other sort of exhibition so far invented by the fertile minds of promoters. The success, or otherwise, of food shows, hardware shows, better-homes shows and so forth, is usually measured by the gross tonnage of the samples carried out through the exits by the visitors. But there were no samples at the aviation show. I hung around here and there, looking lovingly and longingly at the airplanes of my choice, and waiting trustfully for somebody to offer me samples. But there were no samples.

It was very disappointing. I should have liked, for instance, to take home a nice little Hamilton Monoplane for the wife and children, but nobody offered me one. I did manage to get inside one with a little aid, assistance and advice from Lee Wallace, who was working with the Columbia exhibit across the aisle, and I want to put it on the record that it comes pretty close to meeting the requirements of the Family Type airplane outlined in these columns some months back. It even has a bathroom, with all the vital accessories. There was a roll of—er—accessories hanging on the wall that must have been personally inspected by over a hundred thousand people during the week. If Mr. Hamilton knows his duty to posterity, he will send it to the Smithsonian Institution. But even here I couldn't get a sample.

Then there was Dr. Adams' Air Mail Pick-up, which was working right next to the AERO DIGEST booth on the third floor and giving us all a lot of innocent fun. It's a trick for changing mail bags in full flight with a single twist of the wrist, and the Doctor has promised to work out a modification of his machine that can be used for changing the baby's inner tubes, which will save the family men of the nation an untold amount of unproductive labor. Some of the more hard-working members of the staff of this magazine sat there for hours and hours and watched the model plane drop a model mail bag on a model field, while at the same time picking up another mail bag and so on and away. An interesting technical detail of the device which attracted a lot of attention, particularly from the advertising department of AERO DIGEST, was the little girl in the snappy green flying suit and the other one in red. They worked the models and smiled at the customers, and added a lot of sex-appeal to the third floor front.

This business of dressing female aviators in costumes that take a man's mind off his work, is getting to be one of the serious hazards of the profession. I was afraid of it, way back in the days when I used to hang around Pitcairn field and watch such intrepid aviators as Jim Ray and Ben Faulkner and Ray Rafus as they tucked the girls and their skirts into the passenger seats for a three-dollar hop. Whatever else aviation might turn out to be, I could tell even then with half an eye—which was about all the eye I usually had left at the end of a summer afternoon—that



a summer afternoon—that it would prove a heaven-sent opportunity to the female of the species to figure out a new way to dress the part. But I had no idea until I saw this show that she has already decided what the well-dressed woman will wear for morning, afternoon and night flying, for altitude tests and endurance flights, for closed-cabin jobs with bridge tables or open cockpits with parachutes. I took in a few demonstrations on the subject here and there around the show, but once again I couldn't get no samples.

They were giving away a sort of samples at the demonstration parlor of the Ruggles Orientator. The Orientator is a development of the old idea of learning to swim without getting wet. The hopeful and confident young flier sits in the thing and tickles the controls, and the most surprising things happen. They were handing out sample rides with the utmost generosity, and nothing but my natural modesty and distrust of the lateral stability of my last ham sandwich prevented me from pushing my way to the front and taking a chance. As it was I watched a charming young lady break the record for ground looping. She had done so well on right and left turns that the demonstrator invited her to try a dive, which in no time at all turned into an outside loop. Then she froze her controls and went right on looping, emitting a surprised scream whenever she found herself upside down until the man at the switch remembered that he was born a gentleman and stopped the merry-go-around.

There were a lot of distinguished visitors at the show. I never saw any, but wherever I went I heard about them. Half the front page pilots of America spent a lot of time at the show keeping out of my way. For the first day or so I took it for granted that every leather jacket in the crowd meant a pilot, but I decided after a while that there couldn't possibly be so many pilots in one place with nothing to drink. Moreover, a lot of the leather jackets seemed to have girls inside of them, and none of them Amelia Earhart. Amelia was supposed to be upstairs in charge of the *Cosmopolitan Magazine's* fancy furniture, but whenever I went up there, she had stepped out to do a little editing. Otherwise I might have asked her for a sample, she being generally kindhearted and generous. As it was, the only sample magazine I got was a copy of the February AERO DIGEST, which was given to me partly because I have influence with the editor and partly because nobody saw me take it.

The only really important aviator I met at the show was Elinor Smith. Elinor was about three-fourths of the Brunner-Winkle exhibit, keeping company with the Bird biplane in which she did her stuff. She handed me a full pint of advice to pass on to ambitious girl pilots, to the effect that an endurance flight is a picnic compared to a day's duty at an aviation show, answering fool questions and wise cracks from brother and sister pilots. I didn't ask any questions nor make any wise cracks, principally because the more I looked at Elinor the more I couldn't think of any. Elinor is like that. Also she had on a blue hat, and blue is my most fatal color. Furthermore she did most of the talking, and left me deep in debt by suggesting that someone ought to write the diary of a female flying student. Right away I could see that my whole journalistic career to date has been nothing more than practice and preparation for writing the diary of a female flying student. Just as soon as I get this show out of my system, I intend to start work on my really important contribution to aeronautical literature. The more I thought about it afterwards, the more I liked the idea, and so I worked my way back to Elinor with the idea of taking her

out for a friendly ham sandwich and maybe a cup of coffee. But some other bozo had beat me to it.

So to drown my sorrows I spent a day or two in the schoolboys' section, where there were models of every known type of airplane and a lot of others. Sundry department stores and aviation organizations and magazines had offered a ton or so of prizes and trophies for the younger generation, and the competition was something fierce. The contest seemed to be still going on, and there was a bench full of youngsters at work on scale models. I tried to chat a while with Joe McCall of Brooklyn, who was fitting the wings to a monoplane, but he was much too busy to be bothered.

I told you that I tried to get acquainted with the management of the show. Well, I never did locate the management. By the time I got around to it, the show was cruising comfortably with hands off, and the management was probably over in the hotel playing pinochle. I wanted to see the management because I wanted to borrow the show. I wanted to take it on the Chataqua Circuit and also to Philadelphia. All I found in the administration offices was a blonde and a notice announcing the next New York Aviation Show for February 5-12, 1930. I took a good look at both of them and make a quick get-away to the Pyrene exhibit of fire extinguishers.

So I never got a chance to tell the management that I approved of the show. I wanted to do so, because in my dark and deplorable past I once took a hand in running a show. It wasn't an aviation show, but it had its own numerous and assorted difficulties and unpleasantnesses. Running a show of any sort is no picnic. If you lose money on it you get no sympathy, and if you make money, you are liable to be labelled a crook and highway robber. When you start selling your show nobody will come in, and at the last minute everybody wants to come in, and all in the same floor space. Ten minutes after the show opens half the exhibitors want to be moved into another location, while the other half is busy breaking all the city ordinances, fire regulations, and building laws. If the crowd is small, you get blamed for not advertising the show; and if it is big, you get cussed because nobody has any room in which to do business. All the exhibitors want passes for themselves, their relatives, friends and creditors, and most of them expect free gas, electricity, and hot and cold running water.

I left the show in somewhat of a hurry. My nerves were probably a little upset, since there was an exhibit of the Stevens "half-cycle" motor which was liable to go off at any moment. In the Curran exhibit, there was a tricky little motor muffler which might have helped the situation, but the motor was in the front of the building and the muffler on the second floor back, and they never seemed to get together. Well, there was a perfectly beautiful young lady who had something to do with the AERO DIGEST exhibit, though I never caught her actually doing it. Just after the fourteenth ham sandwich on the last day of the show, she came zooming in to the booth wide open with excitement. "They're cutting out silhouettes on the second floor," she says. "Everybody's having them cut out," says she.

"Who is?" says I, going a little pale.

"Everybody," says she. "You simply can't leave the show without having your silhouette cut out."

Well, I'm still a little sensitive about my operation last spring. A lot of things were cut out of me that I didn't care to part with. And now it was to be silhouettes. I made the stairway in two jumps. As far as I was concerned the show was over.

# THE NEW N.A.C.A. COWLING

## and its application to the Lockheed "Air Express"

A DEFINITE improvement in the performance of most types of aircraft has been made possible with the advent of the new N.A.C.A. cowling for radial engines. In the application of the cowling to many present type of planes, however, the designer will encounter certain difficulties to combat which, successfully, requires a very definite idea as to the exact aerodynamic action involved.

It is the purpose of this article to present a simple explanation of the aerodynamic principles of the new cowling and to define some of the difficulties already encountered in its application to the record breaking Lockheed "Air Express," as well as the methods employed in overcoming these difficulties.

There are three possible explanations of the reduction of resistance due to the use of the cowling.

The first, and most obvious, is that the outer cowl acts very much in the same manner as the auxiliary airfoil of a slotted wing. It changes the direction of airflow over the nose surface of the fuselage, bending the flow of the air inwards toward the center of the fuselage just aft of the engine cylinders and causing the air to follow closely the contour of the fuselage clear through to the tail. The action in this case is analogous to the prevention of burbling of a wing by the opening of the leading edge slot, it being assumed that the cylinders cause a discontinuity in the surface of the fuselage which promotes burbling or departure of the streamlines from the surface.

The second explanation, which may or may not be erroneous, is that the air is compressed appreciably in the space between the inner and outer cowling by the action of the slipstream in forcing accelerated air into the nose opening, and that this air, due to the pressure between the two (outer and inner) cowlings, is accelerated as it issues from the relatively narrow slot at the rear. The effect of such an action is that the air, thus accelerated straight back from the narrow slot, washes off the boundary layer of vortices

causing a flow of air to follow the surface from the rear opening of the cowling to the tail of the fuselage. This action is similar to the liberation of compressed air from jets pointing backwards on the upper forward surface of a wing. Results approximately similar to

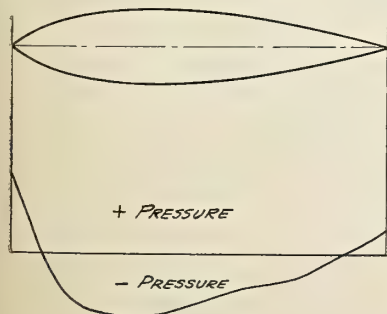


Fig. 1. Curve showing pressure distribution on a streamline body.

By

Gerard F. Vultee

Chief Engineer, Lockheed Aircraft Co.



Gerard F. Vultee

those obtained with the Handley-Page slotted wing have been secured by this means.

The third, and perhaps simplest, explanation of the reduction in drag due to the new cowling, is suggested by a study of the airflow over a streamline body. Figure 1 represents a streamline body and the curve of pressures over the surface of the body plotted against the distance from the nose to the tail. Positive pressures are plotted upward, and negative pressures downward. Figure 2 represents the same streamline form with projections similar to the cylinders of a radial engine and a curve like that of Figure 1, showing the pressure distribution which might be expected in this case. It will be noted that the negative pressure behind the cylinders of the engine is much greater than in the case of the simple streamline, due to the flow separating from the body because of the distributing influence of the cylinders. This naturally causes a decided increase in the drag of the entire body.

The action of the cowling from this point of view is solely that of a medium to equalize pressures. It takes air in at the region of positive pressure at the immediate nose of the fuselage and releases it at the region of negative pressures in the rear of the nose. Obviously any means which will decrease the negative pressure or suction over the rear portion of the fuselage will decrease the drag. As another way of thinking of the same action, the cowling supplies a large volume of air at such a point that it must flow back over the after part of the fuselage and relieve the suction caused by air leaving the surface at a point near the nose.

A careful consideration of all three of the foregoing explanations of the action of the cowling reveals the outstanding fact that any reduction in drag obtained by its use is due to its effect on the fuselage *aft* of the engine and the cowling itself. It therefore follows that the form of the fuselage over the after portion is now more than ever of paramount importance, for obviously if the air flow is brought down to the surface of the fuselage only to leave it again because of rough and unfaired sections of the after body, the effectiveness of the cowling in reducing the total drag is greatly impaired.

With the foregoing discussion of the aerodynamic character-

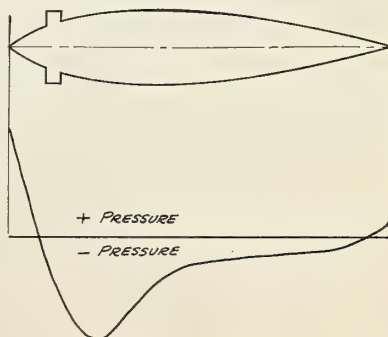
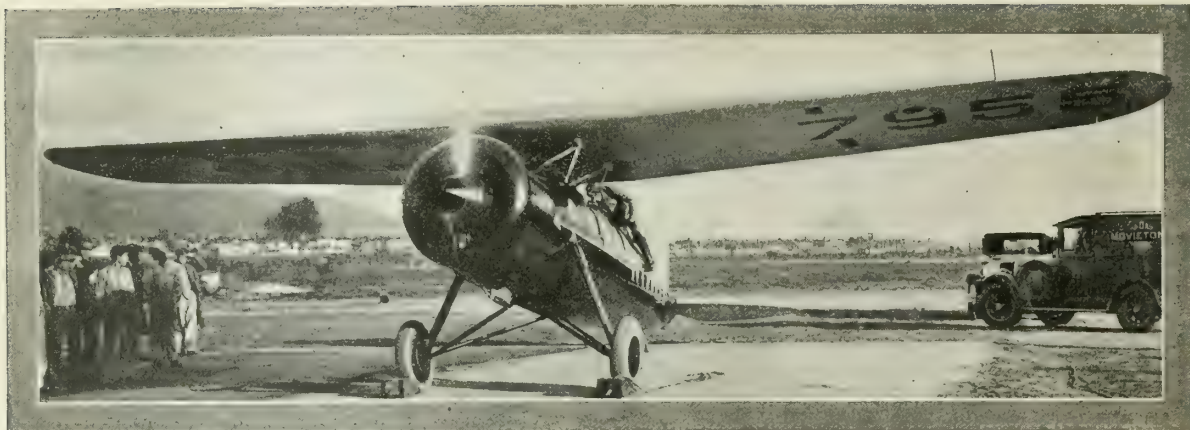


Fig. 2. Pressure on a body with engine.





The Lockheed Air Express used by Capt. Frank Hawks, showing the new type cowling.

istics as a basis, it will be of interest to follow through the problems which were encountered in applying the cowling to the "Air Express" model Lockheed ship. This model, as will be noted by the accompanying illustrations, is a parasol type monoplane. The isolated position of the fuselage in regard to the wing renders the fuselage particularly free from obstructions which would interfere with the retention of the smooth streamline flow of air which the new cowling establishes.

Since this model is intended for the use of mail and express lines operating over fairly long routes, any increase in cruising speed is accompanied by a decided decrease in operating costs. An increase of approximately 17 miles per hour has been obtained in cruising speed by the use of the new cowling. This has been accompanied by an increase of twenty miles per hour in top speed. The first test made was a speed run of short duration which served, however, to establish the two following facts:

(1) The top speed of the ship, (definitely established as 160 miles per hour with the former cowling) has increased to 180 miles per hour. The maximum r.p.m. of the motor increased from 1,950 to 2,025 with the same pitch setting of 20.50 at the 42-inch station on the propeller.

(2) The oil temperatures were running too high, reaching a maximum of 90 degrees C. The first tests were concluded as soon as the excessive oil temperatures were noticed in order to avoid harming the motor.

The reason for the overheating of the oil was found to be due to the design of the exhaust system.

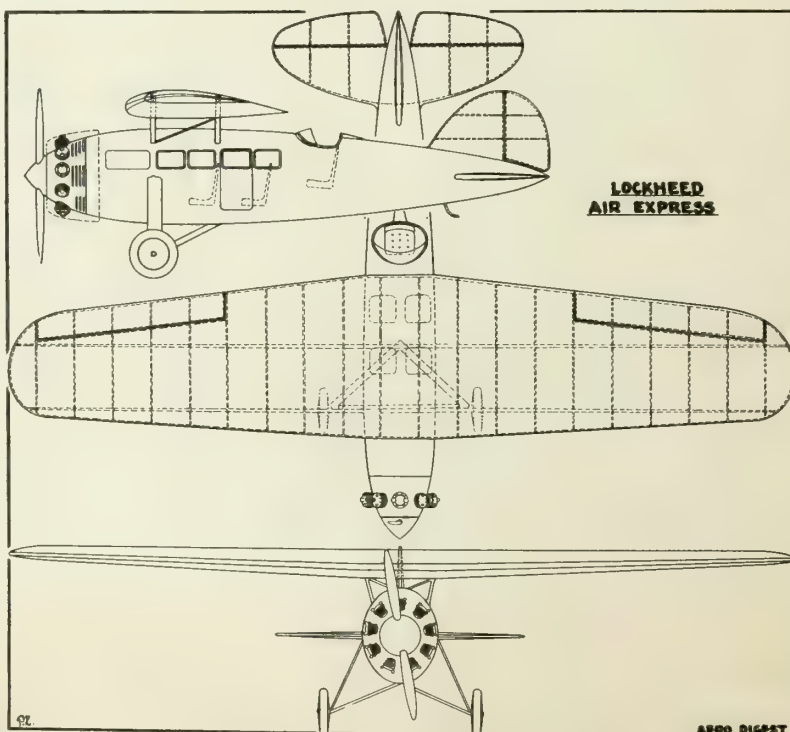
With standard cowling, all Lockheeds are equipped with an exhaust collector ring located inside the rear cowl. This feature has proved very satisfactory. The interior installation served to clean up the lines of the ship and the collector ring cooled well in warm weather and afforded temperature control in cold weather. Ample louvres were provided in the rear cowling to dissipate the heat quickly.

With the new cowling, however, the conditions were completely changed. The negative pressure which formerly existed immediately behind the cylinders and served to draw the heat from the exhaust ring out through the louvres was replaced by a positive pressure due to the restriction of the air by the outer cowl. This positive pressure held the heat from the collector ring inside the inner cowling and caused excessive heat in this location.

It was decided to remove the collector ring from inside the inner cowling and install a streamline ring in the space between the inner and outer cowlings.

While the new collector ring was being made up thermo - couples were installed in the rear plug bosses of each cylinder. These thermo - couples were connected to a sensitive pyrometer in the cabin of the ship. A selective switch was installed to enable readings on individual cylinders.

When the above work had been completed, the flight tests were resumed. The first flights (Con. on p. 222)



Outline drawing of the standard Lockheed "Air Express."

# WELCOMING THE AVIATION INDUSTRY INTO BIG BUSINESS

NOT only big business but little business—which may be big tomorrow—welcomes aviation to transportation's fourth estate. Rail, ship, highway, air. Perhaps a year ago business would have welcomed aviation as a first-class novelty, but the twelve months have seen it grow in stature until it has become a utility. Civilization has come to it, and not only big business has recognized its stability and its future, but, if the stock market is any criterion, the public has also placed its stamp of approval upon this newest of the new of our major industries.

And what a marvelous 25 years this new industry has experienced; what amazing years ahead. Aviation was born in an age of congress gaiters, fancy vests, night shirts, home-cured meats, homemade bread, high-wheeled buggies and the livery stable, the primitive plumbing of an age that found amusement in the parlor stereotyped in the autograph album and the magic lantern.

Those good old days are gone. Aviation has witnessed the building of the Panama Canal, the laying of the first Pacific cable, the making of the Tungsten Lamp, the first transcontinental telephone line, transatlantic telephony, rural free delivery, parcel post and commercial photographs by wire. The man whose reading goes no further than the paper's first page must be touched by the epic quality of the age—fleets of airplanes lugging mail and express by night and day; casual talk of airports in railway stations; telephone conversations with London, Stockholm, Berlin; radio creating its own trade-in problems; television bringing shudders to the speaking stage.

But if the past ten years have been an amazing decade, what shall we say of the coming ten years? General Squire, who has done so much for telegraphy, telephony and radio, said to me recently, "I am 63 years old. I was born in an age of coal oil lamps, the single tracked railroad, halting telegraph and Uncle Tom's Cabin in a tent. I am living today in an age of electricity, radio, airplanes and Uncle Tom's Cabin in the talking movies.

"But the next ten years," he added, "will give me more marvels than the last 50."

If you join the ranks of big business, you must not only accept the opportunities but also the responsibilities. Business is now occupied with those responsibilities. It is engaged in removing obstacles that lie in the way of greatly accelerated business activity. It is not wholly selfish in promoting more business; rather, it is an enlightened selfishness. It feels that business is inarticulate. It doesn't readily voice its aspirations and ideals. If it would stop long enough in its task of providing food, shelter and clothes for the rest of us, it might phrase its innermost motives. If so, it would express itself thusly:

Business has raised by centuries the standards of living

By  
Merle Thorpe  
*Editor of Nation's Business*



of millions of people. Our industrial system, conceived and brought forth in America, with all its faults, has created three times more material wealth in its short life than the whole world had been able to create up to 1776. It has no apology to make for its materialism. It believes that increased business activity will provide greater opportunity for each individual to exchange what he has in goods, services or labor for what someone else has in goods, services or labor. This is necessary if we are to abolish poverty from the land.

There are those in every city who, in spite of the widest distribution of material comforts that the world has ever seen or dreamed of; there are those in every city who need more and better food, more and better clothing, more adequate shelter; there are those also who desire more of those conveniences which go to make a fuller and richer life. There are others who, having the necessities and conveniences, desire the luxuries of life—

art, painting, music, travel. Until all worthy desires are satisfied, business must not be content. It must ceaselessly strive to increase the tempo of making and distributing until every want is satisfied.

To this end, then, your responsibility as a new industry lies in coöperation with business today, which has as its ideal the removal of all obstacles to this greater accelerated business activity. Surely all of us can stand on that platform. Obstacles there are, of our own making. Business has inherited from an earlier and less responsible age practices which, like the little foxes who destroy the vines, are slowing down business progress. Practices there are of which we as individuals are ashamed, but which, as individuals, we are unable to stamp out—commercial bribery, wild-cattling of securities, flouting of public opinion, lack of respect for wholesome regulation—that long list of unfair, unethical business practices, countenanced and indulged in by a small percent, which brings all business into disrepute, shakes confidence, arouses suspicion and antagonism, and prevents us from reaching the shining goal in the shortest time possible.

Aviation, being youthful and impulsive—with illusions, Yes—must help to rid the stream of barter and trade of these obstacles.

There are other obstacles, not of industry's own making. I refer to those set up by governments, oftentimes in an honest thought that such obstacles are in the public interest. But, more often, brought forth from the bed of ignorance and political expediency. Foremost among these is the ever-present panacea of politicians, that they can carry on business enterprises more successfully and more in the interest of the public than can the individual. Whether it is called socialism, or paternalism, or bureaucracy, it is with us always. It menaces our continued (Cont'd on p. 228)



# SKY SLANG

By C. B. Allen

**A**VIATION, like every other calling under the sun, has developed its own peculiar phraseology; forms of expression which are in everyday use on the flying fields of the country but mean little more than so much Greek to the average non-flying outsider. Some of these words are good technical terms, others are colloquialisms which have adapted themselves to flying, and others are mere colorful slang which has "rung the bell" and become firmly imbedded in the aeronautical language. Many are of interesting derivation. The origin of others is obscure, lost or forgotten in the swift progress of an art but twenty-five years old, while still others obviously have been minted to meet a situation for which no suitable word existed.

An effort has been made here merely to set down a list of such words and phrases as occurred to the writer from memory or were suggested by a brief browsing about in an aeronautical library. A good bit of information on the subject was gleaned from the glossary of air terms and expressions included in the correspondence course of the Aviators' Institute of America. Nevertheless, it is rather with the idea of presenting interesting data as such, than with any notion that the material at hand is the last word in either accuracy or finality, that the following material is offered.

**Ace**—Properly, a war flier who brought down five or more enemy planes. Now applied to any kind of aviator when the copy-reader needs a short headline.

**Apron**—Has nothing to do with the mystic rites of being a flier; merely something to cover a hangar's lap. Usually a concrete approach in front of said hangar where planes can "warm up" without raising too much dust.

**Archy**—A gun that shoots at airplanes and shoots, and shoots and shoots. So called by virtue of a dance hall ballad, popular in England at the outbreak of the war, called "Archibald, Certainly Not!"

**Aviator**—The fellow who wears a leather coat, flying boots, helmet and goggles as distinguished from the boy in the baggy blue suit who really flies the plane.

**Bus**—The thing you fly in. Also called a crate, a job, a wreck, a ship, or even a plane. Rarely if ever referred to as an airplane.

**Barracks Flying**—The conversational brand of aeronautics. Productive of the world's best airmanship. Favorite occupation of all aviators.

**Balloonitic**—One who flies balloons.

**Cabre**—To fly at a stalling angle waiting for other planes in formation to catch up.

**Ceiling**—The maximum altitude to which any given plane can rise.

**Crab**—Pointing the plane one way to fly another; method of correcting for cross wind.

**Crash**—Anything worse than a bad landing.

**Crack-Up**—Another name for a crash.

**Dep Control**—As opposed to the *stick* or *joystick* method of manipulating elevators and ailerons; a wheel control similar to that on an automobile.

**Dead Stick Landing**—Gliding into a field after the motor has stopped and the propeller no longer is turning over.

**Dolly**—The two-wheeled carriage used as a caster under the tail of an airplane for moving it in and out of the hangar: almost invariably identified by outsiders as the "rear wheels" of the plane.

**To Drag**—Flying low over a field where a landing is contemplated to ascertain the advisability of even more contemplation.

**Dope**—Either hot or cellulose. In the former event it means the latest rumor and probably the wildest one; in the latter

case merely something to shrink the fabric on airplane wings, fuselage or tail.

**Fish-tail**—"Kicking" the ship from side to side to kill its forward speed for a short landing by violent over-control of the rudder.

**Flat Spin**—A dazed condition resulting from alcoholic excesses or from an habitually "goofy" state of mind, either congenital or acquired. The subject is out of control but still going. Also a variety of tail spin to be avoided by pilots without parachutes.

**Flaming Coffin**—Ask anybody who flew a war-time DH.

**Godunk**—The lad who will do anything to get a flight except pay for it.

**Ground Loop**—The simplest maneuver known to aviation. A sharp turn on the ground, made when landing or taking off. A cross wind and a touch of absent-mindedness will enable the novice to execute it perfectly as an artistic finish to any landing.

**Grease Monkey**—An apprentice mechanic in aviation.

**Gun**—The throttle; opening it is to "give it the gun."

**Gas**—The stuff that makes the airplane go. Our English cousins call it *petrol* in everyday conversation, or *motor spirits* if they want to be really high hat.

**Hop**—A flight. One may go for a hop around the field or hop off for Europe.

**Horses**—The power delivered by a motor. If it has lots of pep and is turning up as it should, an engine is said to be "turning out plenty horses." Derived, of course, from horsepower.

**Haywire**—The aeronautical way of saying something is all wet. Probably originated from the practice of resourceful but needy barnstorming pilots who repaired their airplanes with lengths of wire used in baling hay. A poorly constructed airplane is said to be haywire in its build.

**Hisso**—A Hispano-Suiza motor.

**Jenny**—War-time Curtiss training plane, the JN-4-D; the Canadian version of the same ship was called a *canuck*.

**Jazz**—To clear a motor by opening the throttle occasionally when gliding; a town is "jazzed up" by diving low over it and otherwise performing forbidden stunts.

**Kay-Dee**—A student aviator; properly a "Flying Cadet."

**Konk**—To cut out, quit; said of a motor.

**Kee Wee**—Properly a Kiwi, an extinct wingless bird; term of opprobrium and contempt applied to non-flying officers who had charge of the destinies and frequently the lives of fliers during the war.

**Modock**—A fellow who wears flying clothes and is going to do big things for aviation.

**Monkey Suit**—Any kind of uniform.

**Prop**—The propeller; also called the *stick*. The *prop wash* is the disturbed wake of air churned down and backward by an airplane in flight. The blast of air from the propeller proper is called the *slip-stream*.

**Pancake**—To flop down in landing much as the breakfast dainty smacks the griddle; a stall landing where the "bottom drops out" and brings the plane down with a bang (and frequently a crash) through the last ten or fifteen feet.

**Pill**—A bomb. Also called an *egg*, in which case the plane "lays an egg."

**Porpoise**—To land in a series of long but lessening bounces; if the plane isn't sturdy the landing may end on the first bounce.

(Continued on page 226)

# AERONAUTIC RESEARCH AT THE NATIONAL BUREAU OF STANDARDS

**A**ERONAUTIC research at the Bureau of Standards is, for the most part, carried on in coöperation with and with the financial assistance of the Aeronautics Branch of the Department of Commerce, the National Advisory Committee for Aeronautics, the Bureau of Aeronautics of the Navy, and the Army Air Corps. This report contains a brief description of some of the investigations which are being included in this work.

## Directive Radio Beacon System

A directive radio beacon system has been developed during the past year for use on our transcontinental airways. This beacon sets up a fixed course in space which may be used to direct airplanes in flight. A visual indicator has also been developed for use on an airplane flying this course by means of which the pilot can tell at a glance whether he is on the course.

The directive radio beacon consists essentially of a master oscillator supplying power at 290 kilocycles to two power amplifiers, which, in turn, feed two loop antennas crossed at an angle of  $90^\circ$  with each other. Each power amplifier is modulated to a selected low frequency note, the two modulating frequencies chosen being 65 and 85 cycles per second, respectively. One loop antenna, therefore, radiates a 290-kilocycle wave modulated to 65 cycles, while the other emits a 290-kilocycle wave modulated to 85 cycles. Due to the directive properties of the loop antennas, these waves are a maximum in the directions of the planes of the antennas transmitting them and of zero value in directions perpendicular to these planes. An airplane flying along a line bisecting the angle between the two antennas will, therefore, receive the two waves with equal intensity. If the airplane deviates in either direction from this line the signal from one antenna becomes stronger and the other weaker. Equality of received signals thus indicates a fixed line in space and provides a means for guiding aircraft along that line.

At the receiving end a visual indicating instrument is used, consisting of two vibrating reeds mechanically tuned to the two modulating frequencies (65 and 85 cycles per second). This instrument is

By  
**Lyman J. Briggs**

*Assistant Director, Research and Testing*



Lyman J. Briggs

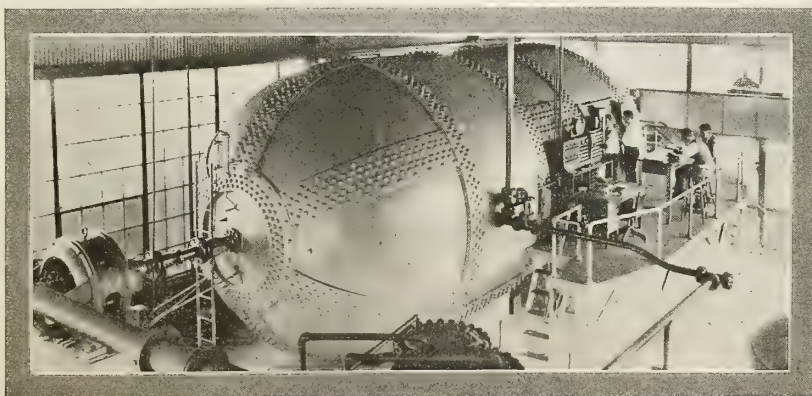
mounted on the instrument board of the airplane and is electrically connected in the output of a sensitive receiving set. When the beacon signals are received the two reeds vibrate and, since they are tuned to the two modulating frequencies used at the beacon, serve as a device for indicating equality of received signals from the two loop antennas. The tips of the reeds are white against a dark background, so that when vibrating they appear as vertical white lines. When the two lines are equal in length the airplane is on its course, a deviation from this course to the left increasing the deflection of one reed and decreasing that of the other. The reverse is true if the airplane deviates to the right of the course. To return to the course the pilot turns in the direction of the shorter reed.

## Relative Visibility of a Neon Lamp and an Incandescent Lamp Beacon in Fog

It has been the impression of some pilots that the rays from a neon lamp possess greater fog-penetrating qualities than the rays from an incandescent filament beacon. To determine this matter, a recent field test has been carried out on the relative visibility through fog of neon and color-screened incandescent filament lamps when mounted in a flashing rotating beacon. The experimental conditions were so controlled that the determining factor was the difference in the character of the light sources themselves—the one a neon lamp, the other an incandescent filament lamp with color screen. The candlepower, the color, and the size and shape of the effective light sources of the two beams were made as closely alike as possible.

The test shows that there is no real difference in the fog-penetrating quality of light from the two sources. In beacons of moderate candlepower, any advantages due to the distinctive color of a neon lamp may be obtained more conveniently and simply and more reliably by means of an incandescent filament lamp equipped with a suitable color screen.

Comparison of two incandescent filament lamps of equal energy input, one of which was provided with a red color-screen having a transmission coefficient of approximately 30 per cent, showed



Exterior of variable density wind tunnel at Langley Field, Virginia



that the white light could invariably be seen a greater distance through fog than the colored light.

#### Sound Proofing Airplane Cabins

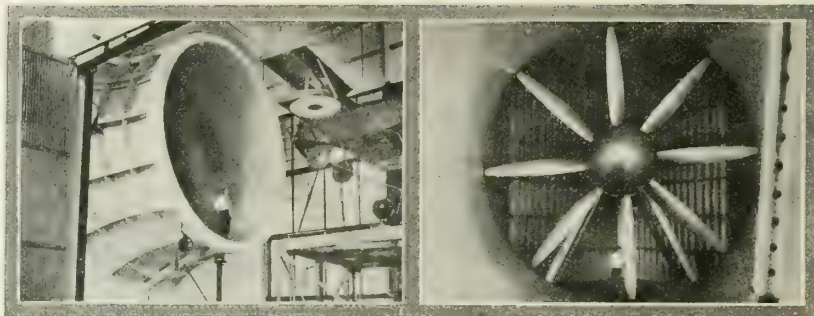
The comfort of a passenger during an airplane flight must be provided for if the airplane is to compete effectively with other modes of transportation. It is highly desirable that the noise within the airplane cabin should be reduced to the point where conversation can be carried on without difficulty. Muffling the engine provides one means of reducing this noise, but probably with some attendant loss of power. The noise produced by the propeller can perhaps be reduced to some extent by further studies in design. Finally, the passenger may further be protected if the cabin walls are treated in such a way as to reduce the intensity of the sound entering the cabin and to absorb the sound as rapidly as possible within the cabin.

In applying sound proofing material to airplane cabins, the weight of the material is an important consideration. Furthermore, the material must not absorb moisture. The first experiments at the Bureau were made with single layers of various materials, but it was soon found that it would be impossible to secure a satisfactory degree of insulation with a single layer of any material unless that layer was very heavy.

The next attempt was to use two layers of light material such as aluminum with a space between, either left empty or containing a filling material. Experiments with brick and tile walls had shown that an air space was better than filling material, but with light structures the reverse proved to be the case. Taking both weight and sound transmission into consideration, the most efficient combination for airplanes so far found consists of three layers: aluminum sheet, a filling material known to the trade as "dry-zero blanket," and a sheet of 5/16-inch insulite. This combination weighs one pound per square foot of interior cabin wall. It is as opaque to sound as a single layer of any material five times its weight. The next best consisted of dry-zero blanket between two layers of 1/8-inch plywood. It is believed that equally good results would be obtained if boards of celotex or other fibrous materials were substituted for the insulite.

#### Wind Tunnel Research

The Bureau has three wind tunnels in which the testing of aircraft and other models is carried out. The largest tunnel has a throat diameter of 10 feet and has no building surrounding it. On relatively still days, this arrangement gives exceptionally steady flow conditions at the en-



Entrance cone propeller research tunnel and 8-blade propeller

trance cone. The smallest tunnel (3-foot throat diameter) has a maximum wind speed of 180 miles per hour and is now used largely for the calibration of aircraft instruments.

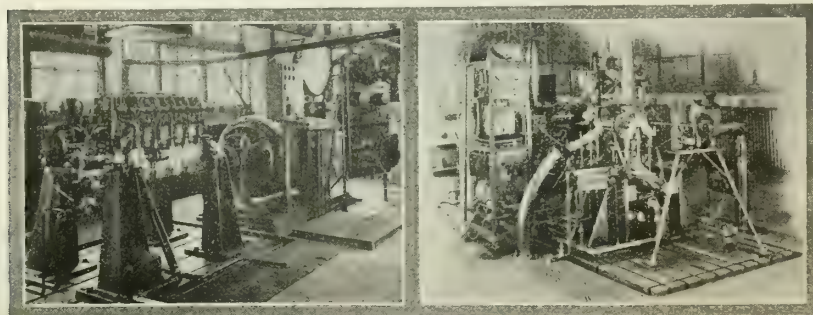
A rather extended series of measurements on small airfoils has also been carried out in a high speed air stream at various speeds up to the speed of sound, with special reference to propeller design. The results show a marked decrease in the lift coefficient of airfoils with increase in air speed, beginning at approximately 0.8, the speed of sound. This is accompanied by a rapid increase in the drag coefficient. The center of pressure also moves back toward the trailing edge.\*

#### Aircraft Instruments

Research on aircraft instruments at the Bureau of Standards has covered such problems as the measurement of the viscosity of damping liquids for aircraft instruments, the investigation of the phenomena of the elastic hysteresis and drift, the investigation of the effect of temperature on the elastic moduli of metals, and the measurement of the friction of instrument pivots and bearings. The instrument development work has included the construction of resistance thermometers with small time lag for the measurement of air temperature, the construction of small size galvanometer units for use on aircraft, the development of two altimeters and an altigraph which, with suitable precautions in installation, indicate or record altitude differences as determined by pressure and temperature measurement, the development of the commutator-condenser suspended head type air speed meters for airship and airplane use, and the addition of a large number of improvements to existing types of instruments.

The testing of aircraft instruments has been given much attention. This work has included the type testing of a large number of instruments of each type, the modification of tests, the development of new tests, the improvement of testing equipment, and the development of new testing apparatus. When failures to meet specifications have occurred, the technical resources of the laboratory have been

brought to bear in an effort to locate the trouble and to suggest the remedy. The reports on the results of the type tests have not only been of use in deciding on the acceptance or rejection of the instruments concerned, but also as a source of information for use in revising specifications and gradually reducing the



Dynamometer laboratory test stand and single cylinder test engine

\* See Briggs, Hull and Dryden: *Aerodynamic characteristics of airfoils at high speeds*, N. A. C. A. Tech. Report No. 207 (1925). Briggs and Dryden: *Pressure distribution over airfoils at high speeds*, N. A. C. A. Tech. Report No. 255 (1927). Briggs and Dryden: *Aerodynamic characteristics of airfoils at high speeds*, N. A. C. A. Annual Report for 1928. In press.



tolerances. The information thus made available has been an important factor in the improvement of the performance of aircraft instruments in the last few years.

Aircraft instruments are subjected to a variety of conditions which affect their performance. The majority of these conditions are not experienced in ordinary engineering use and therefore need be given but little consideration by the manufacturer of ordinary engineering instruments. The following list shows the items which must receive consideration in the testing of aircraft instruments under current specifications: scale errors; temperature errors; pressure effects; vibration; position error; time lag; durability; acceleration; damping; strength tests; leaks; elastic defects; friction.

#### Corrosion of Duralumin

Duralumin is one of the most important materials entering into aircraft construction. It has sometimes been found to get brittle in service or in storage as a result of an intercrystalline corrosive attack, which is not necessarily disclosed by surface inspection and consequently is insidious and dangerous. The embrittlement of duralumin in service is rather rare because the presence of moisture is necessary and much of the duralumin used is protected. Furthermore, intercrystalline corrosion depends upon the heat treatment. If it has been properly heat-treated, it is much less subject to attack.

Quenching slowly (in hot water or oil) gives material subject to embrittlement. Quenching rapidly (in cold water) gives good material.

Measurements are also in progress in the 10-foot wind tunnel for the purpose of determining the rolling, yawing and hinge moments due to ailerons of various chords and spans. The Clark Y and U. S. A. 27 wing sections have

† (See Heald, R. H. and Strother, D. H. *Effect of Change of Chord and Span on Rolling and Yawing Moments in Level Flight*—N. A. C. A. Technical Report No. 258).

been selected for this work. The model has a span of 60 inches and a chord of 10 inches.† The mechanical properties of new material are not appreciably affected by the method of quenching.

The undesirable effect of hot water quenching and the satisfactory results obtained by means of cold water quenching were found by accelerated corrosion tests in the laboratory and were subsequently verified by actual exposure tests. The atmospheric conditions in the Canal Zone are particularly favorable for rapid embrittlement.

The composition of duralumin has little influence on corrosion, and there appears to be no hope of controlling it by changing the composition. Cold working is not very harmful.

Although duralumin can be made quite reliable simply by putting it through the proper heat treatment, under severe corrosive conditions there is still a slight tendency toward embrittlement, which is most marked in very thin stock, and consequently the surface protection of the duralumin is still desirable. A further reason for surface protection is that ordinary pitting (not intercrystalline) corrosion is not prevented by controlling the heat treatment.

Of all the coatings for duralumin, pure aluminum is the best. Pure aluminum is not at all subject to intercrystalline attack and only slightly subject to pitting. This property is utilized in "Al-Clad" (duralumin coated with pure aluminum), which is an outgrowth of the laboratory research.

The behavior of "Al-Clad" in fatigue tests and its corrosion under fatigue conditions are still to be definitely determined. The present indications are that "Al-Clad" is weaker than uncorroded duralumin, but better than corroded duralumin.

(This article will be continued in the April issue, in which Mr. Briggs will relate the Bureau's work on airships, welding, tubing, fatigue machine, engine testing and research.)



An aerial view of Langley Field, Va., showing the N.A.C.A. testing laboratories, etc.



# AIR—HOT AND OTHERWISE

**D**ID the American Legion put its big show over at Grand Central Palace, New York City? I'll say it did. Aviator's Post No. 743, made up of men who during the Great War always got to their objectives, surely got to this one. Some hundred of thousands of others who actually saw the show, as I did (very thoroughly and happily), will now join me in a new understanding of why Germany was licked. My hands are up to the American Legion. Kamerad! Kamerad! This show, not a part of the Great War, nevertheless was victoriously connected with a very little and unworthy one—connected with it by the tail, for it took the enemy by some such appendage, dragged it out and tossed it into the ash-can.

Preparations for this show may be likened to a hard fight against head-winds, and that was definitely rotten, for within the industry itself the winds should always follow boostingly. But you can't stop American fliers. You couldn't stop them in war time and you cannot stop them NOW. The mere fact that a number of representatives of the industry played the part of those head-winds didn't bother the boys much. They were astonished, not dismayed. They're fighting boys, you see—AND fliers. Someone in the Aeronautical Chamber of Commerce went out of his way to let the public know, through the press, that it had not sanctioned this show. Perhaps that was why the public flocked to it.

Such minds as were responsible for the show should be promoters of the Peanut Stand Alliance. They made a spectacle of the Chamber, for the Chamber as a whole was technically responsible for what they did, though the episode really was but the rotten petty politics of certain of the Chamber's astigmatic employees, who, in their shortsightedness, though they saw what they have come to think their privilege of being "I-am-its" in aeronautical affairs slipping from them and decided forthwith to stop the process.

Picayune procedure in the midst of a big business. But they are no longer "I-am-its." They now are "I-tried-to-bes."

If that selfish group really had been interested in the development of American aviation instead of in the financial extras, the boys would have had 100% coöperation in handling the show.

Matters of this sort should not be left by the Chamber to men not prepared to handle them either by natural intelligence or acquired education.

However, it's all over now. The show was a success, economically handled, intelligently put on. It was in fact, much better handled than the majority of shows. Every exhibitor was treated right; and the public, treated with courtesy, was fascinated by the sights it saw. Those behind closed doors who had opposed it in the "Grand Council," were the first to try to sneak in when developments made it clear that the Legion boys were winners.

At the meeting of the Chamber held in Chicago, a resolution was adopted to the effect that no sanction should be given by that body to any national show operated by "professional promoters." The industry employs professionals to make its designs for engines and planes, it employs professional bookkeepers to keep its accounts, and professional pilots to fly its ships. Unless they are professional it means failure.

*It Was A Wow!!!*

*A Banquet Plus.*

**By Frank A. Tichenor**

The writer's suggestion is that this resolution be rescinded at the next meeting, and a new one offered authorizing the Board of Governors to hire under contract the professional promoters who put on the New York Show to handle all of the industry's future expositions. It will warrant

and assure the success of every show with which they are connected.

Aviator's Post No. 743, American Legion, surely went over the top. The Post, and especially its Exposition Committee, deserves the commendation of the entire industry for having given future shows a standard to live up to. Commander John Dwight Sullivan, with his fine French name, has set a pace, begobs.

**T**HE Board of Governors of the Aeronautical Chamber of Commerce showed fine intelligence at its ninth annual meeting in the selection of Fred B. Rentschler to head it for the coming year. He is president of the United Aircraft and Transport Company and president of the Pratt and Whitney Aircraft Company. Those who know Fred Rentschler look forward to a year of real development under him. He is a go-getter—the right type for the job, energetic, open-minded, a square shooter, a man with his OWN brains. He is above board, never over board. With F. B. Rentschler as its president, the Chamber is bound to succeed, not only in getting increased membership, but in the addition of new activities to its own sphere of usefulness. Every member of the Chamber will feel newly stimulated now that he is at its head.

**T**HE Progress Dinner of the United Business Interest, under the auspices of the National Exchange Clubs, in New York (Hotel Commodore), January 29th, beat the altitude, speed and cargo-carrying records of aeronautical events. The endurance record only was left without assault. The episode was over all too quickly. Everybody present would have been glad of another hour (or week, or something) of it.

Here was a real triumph, a concrete and impressive, as well as appetizing, evidence that American business is awake to aviation.

The Exchange Clubs have a membership in excess of forty thousand leading business men, scattered from one end of the nation to the other. The dinner was a competent inauguration of the service which they intend to do for aviation.

At last July's meeting in Toledo, resolutions were adopted pledging the Exchange Clubs to support aerial transport and to "institute permanent landing fields, easy of access, near every one of eight hundred cities in which the Exchange Club exists." A survey made before the dinner revealed that already several hundred landing field projects are under way as the result of Exchange activities. Those at Canastota, New York, Mountain Home, Idaho, and Maricopa, California, already are completed as first class airports, and the immediate hope is that a landing field shall soon be easy of access to every city in which the Exchange Club exists.

With such service as this behind it, is it any wonder that the dinner was an outstanding aeronautical event? Over 1,200 persons were at the tables, (Continued on page 224)

# AERO DIGEST

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## AN EDITORIAL CHANGE

WITH this issue George McLaughlin becomes editor of AERO DIGEST, which is a boost for George and an honor to the DIGEST. Mr. McLaughlin has been associated with the magazine from its beginning and will be linked with it until time staggers in its progress through eternity. J. E. Horsfall (Miss) leaves the desk which he will occupy, after having become world-known as an able expert in aeronautics and an accomplished editorial producer. The Publisher has arranged this change for her. The wedding will have happened before this issue reaches its subscribers.

## AIRCRAFT AND CRUISERS

CONGRESS seems to have gone and done it, once again. With wild enthusiasm, not knowing just whose game it was playing, but perhaps honestly believing it was guaranteeing the national defense, Congress passed the mighty Cruiser Bill, without the wise time limit that the President asked, and the people of the nation seem up against this new and mighty item of taxation.

In asking deferred building, Mr. Coolidge was not trying to sidestep expenditure for the protection of the nation, but doubtless was considering the circumstance that cruisers, in the next war, will have little or no value under the blows of aircraft, struck, perhaps, from heights so great that attacked ships will get the first news that an enemy is near when the bombs hit and they begin to sink, with all their millions' worth of steel and guns and ammunition and all that.

## A HINT FROM ITALY

EVERY mail brings to the DIGEST office new proof along the same lines as those followed by the speakers at the great Progress dinner—the definite interest which business men nowadays feel in aviation.

Nor do all of them think principally of the commercial end of flying. Robert P. Stevens, for example, commission merchant of New York, in a letter to the DIGEST, makes a very practical suggestion in connection with Reserve Corps fliers. That's what we're after—the definite, intelligent, informed interest of just such business men as Mr. Stevens.

As a Reservist he has been impressed by Colonel Lindbergh's statement that available Government funds permit Reserve pilots less than ten hours per annum in the air, which is not "enough to enable them to keep in safe flying training." In Italy, as is well known, Mussolini has planned to give the thousand fliers of his Reserve, not ten scant hours a year, but each his own plane—\$2,500,000 worth for the whole country—free hangar space and both gasoline and oil at cost. Mussolini is a great executive who knows his nation's needs and tries to see that they are satisfied. Mr. Stevens writes:

"Possibly there are good and sufficient reasons why the Mussolini plan should be expedient in this country. Per-

haps the question of free hangar space would have to be discarded or revised. However, such an idea could be financed. And with equal certainty it may be said that maximum Reserve flying could be secured by letting the Reserve officer fly his own plane when, where and with whom he wishes.

"Nothing can be done about the 16,500 flying hours for 1929. But for the next year the right kind of work, started at once, would provide at least 'safe flying training' for Reserve officers."

## THROWING MONEY INTO THE AIR

"THROWING money into the air" used to be in the disreputable category in which the Puritans placed all popular sports, such as horse-racing and courtship of more than one girl at a time. It has now become not only respectable, but wise, when the phrase is taken in the sense of meaning investment in aeronautical enterprises. William P. MacCracken, Jr., Assistant Secretary of Commerce for Aeronautics, recently took Congressional breath away by teaching details to the Kindergarten class at Washington.

Search the world for something comparable and come back empty handed. Three years ago the public's money stake in aeronautics amounted to \$5,000,000. Now, thirty-six months later, it amounts to \$150,000,000. During the most recent year of record, 19,000 original medical applications for aviation certificates were received by the Department. During the whole World War, "that terrible emergency," the Army and Navy together received only 16,000.

Mrs. Hasbeen and her husband, reading this will sigh and whisper that it shows how reckless modern youth is. Does it? It does NOT. Aviation insurance rates, during the same period of three years, have been cut, speaking generally, forty per cent.

So the game is not only infinitely bigger than it used to be, but infinitely safer. Bigger and Safer will be the motto of this industry during many years to come.

## FAREWELL TO WILFUL

"THE airplane and its equipment does not furnish a cheap and simple solution of the problem of national defense. It has not rendered obsolete either armies or navies, guns or ships"—an editorial evidently sent out as "syndicate" material by Curtis D. Wilbur, Secretary of the Navy.

Hooziss?

Hoover.

Hoozat?

Wilbur.

Hoozacumminin and hoozagoinout?

Hooverzacumminin.

So, strike up the band and let us pray. Let us pray for whom? Let us pray for Uncle Sam. What duzzee need? (Now, cheer leader—all ready!) He needs air—he needs air—he needs air development.

Mrs. Frank Leslie (peace to her ashes!) once found an Indian along the line of the Santa Fe railroad (a form of transport popular in her day) pounding his finger vigorously with a brick.

"John!" she cried in horror, looking at the mangled thing. "What are you doing that for?"

"Ugh," said the Indian, "feel heap good when stop pounding." CRUNCH. Crunch! Crunch.

That is exactly why (if we are glad at all) we are glad that Mr. Wilbur was Secretary of the Navy.



# U.S.S. "TOOTI-FROOTI"

## A NON-MUSICAL COMEDY

Book by Hotten Bothered; Lyrics by Anne Howe Weary; Incidental Numbers by Betty Buttonoff;  
Costumes from Gimbel's Basement; Scenery by Interborough Subway Studios.

(Apologies to Gilbert and Sullivan)

The entire production staged under the personal direction of

*by Baldwin*

### ACT I. SCENE 1.

*Quarter-deck of the U.S.S. "TOOTI-FROOTI." View of Norfolk in distance. Sailors, led by Bo'SUN, discovered cleaning brass-work or carrying tea-trays to officers' cabins.*

#### OPENING CHORUS

We sail the ocean blue, aboard the "Tooti-Frooti."  
We're bound for Timbuctoo, all feeling smart and snooty.  
Our Admiral is aboard—we love him very dearly—  
He doesn't do a single thing, but gets twelve thousand yearly.

So yo-ho, my lads! Yo-ho for the bright blue sea!

So long as we can stay on top, it is the life for me.  
But if our saucy ship should sink from bombs or other things,

We'd gaily jump into the drink, and use our water-wings.

So yo-ho, my lads! Yo-ho for the ocean blue;

The Navy hasn't changed a bit since 1492.

*Enter, LITTLE GUTTERPUP, a bumboat woman with a large basket on her arm. She is dressed in a bright red dress and a slight hang-over from last night.*

LITTLE GUTTERPUP:

I'm called little Gutterpup, dear little Gutterpup,

Though I could never tell why.

I sell the boys apples and gum-drops and taffy—

And bottles of gin on the sly.

I'm charming—oh, very!—So jolly and merry;

And glumness I count as a sin.

So if you'd be merry aboard this old ferry

Just give me five bucks for the gin.

#### CHORUS by SAILORS

She's called Little Gutterpup, sweet little Gutterpup,

Though she could never tell why.

She can keep all her apples and herrings and candy—

It isn't the stuff that we buy.

We drive away dull care with stuff sold in glass-ware—

We use it whenever we're dry.

Though old Curtis said we should drink nothing but tea

We sip other things on the sly—Hi, hi!

For sailors should never be shy—Hi, hi!

And never be dry on the sea.

*Enter LIEUTENANT CRAB, a naval air pilot. He is crying softly to himself and flapping his arms slowly and with dignity, like a bird about to take flight.*

LITTLE GUTTERPUP:

Oh, officer! You sure look good to me.

What lovely boys they have upon the sea!

I wish that you would flirt with me awhile—  
And please cheer up, and let me see you smile.

LIEUT. CRAB (*Very sadly*):

I'm trying hard to keep away from girls;

I'm practising forgetting every day.

There's one with laughing lips and golden curls

Whose memory I try to drive away.

I *must* forget the women—Have you heard?—

I'm practising to join Commander Byrd!

(*Sings*)

I love a lass, alas, above my station!

Oh yes, alas! She's much above my station.

The sweetest little girl in all the nation.

The cutest trick I've met on land or water—

Unfortunately she's our Admiral's daughter!

#### CHORUS, GUTTERPUP and SAILORS

He loves the Admiral's daughter—

And he really hadn't oughter.

Socially, he's in the Subway—

She is on the floor above.

If only his promotion

Could equal his devotion

We know that he'd be happy

And successful in his love.

*Enter, ADMIRAL DEDHED, a jolly old sea-dog whose bark is worse than his bite—he lost his last tooth at the Battle of Manila Bay. All spring to attention.*

ADMIRAL DEDHED:

An admiral bold am I, of disposition hearty,

And I am not so old—I'm the life of any party.

My teeth and hair have disappeared—but I don't give a damn.

An admiral doesn't need such things—I'm happy as a clam.

#### CHORUS by SAILORS

We're very glad your hair fell out—

You save on combs and brushes.

And when you talk without your teeth

You whistle like two thrushes.

ADMIRAL:

I am very, very good, and be it understood

I am never known to quail at the fury of the gale

And never, never sick at sea.

SAILORS:

What, never?

(Continued on page 228)

# IF WAR SHOULD COME —

By

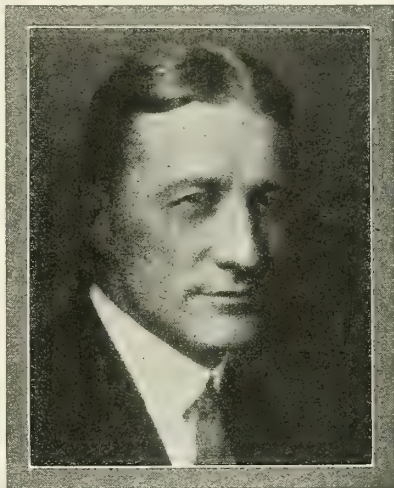
Hon. Arthur R. Robinson

*United States Senator, Indiana*

IT is unquestionably true that the first line of defense in any future war—we all pray fervently there may never be war again but in the event there should be war—will be the air. In the event that the World War were to take place again today, or rather if it had been delayed, if we knew as much about aviation then as we know today, the first thing, for instance, the Central Powers would have done—in speaking of the Central Powers one means Germany because the engineering skill and genius of the German people is phenomenal—would have been to send a whole fleet of airplanes to London and to Paris. In the next war, the question of the freedom of the air will be much discussed as we today discuss the freedom of the sea. There is no such thing as freedom of the seas for your ocean commerce, for your maritime ships, your merchant marine; there is no such thing as freedom of the seas for a neutral country with merchant marine in time of war unless that country has the ships to protect the merchant marine.

The same thing will be true—indeed it is true today—if war should come and we should enlarge our air commerce, as we shall certainly do at a comparatively early date and rapidly. There will be no such thing as freedom of the air unless a nation has aircraft sufficient for the work to safeguard that commerce in the air. Not only that, but another war with this terrifically destructive weapon to be used, would involve the civilian population more than ever before in history. It is not too much to say, that the next war, if there ever be another, and there will be unless human nature should change, will be won by the nation that is best equipped in the air. In one hundred and forty-two years of glorious history, we have never desired war in this country. We have always fervently prayed and hoped and worked for peace, and yet we have been engaged in six major conflicts in those one hundred and forty-two years, and unless human nature completely changes in the next one hundred and forty-two years, work though we may for peace, and we shall, we shall be engaged in six additional major conflicts, history repeating itself.

The nation that is best equipped in the air will win the war. There can be no possible question about it. Armies and navies will be utterly useless in a future war unless they can be protected from the air. A battle in the clouds of two fleets of airplanes would be a marvelous spectacle. It would be filled with sublimity, but it would be the most terrifically destructive warfare one could imagine. But that is not so much the thing to think about. We shall always have brave Americans in this country to defend our interest on the land, the sea, or the air, but individual planes can go out from each country wrecking cities and towns everywhere. Planes could destroy the Panama Canal in less than an hour—less than a half hour if in sufficient number. The City of New York could be laid waste in less than no time, and would be, unless the United States had planes there to drive away the invaders and to hover over the city



and protect it. Harbors and docks would be destroyed; fleets lying at naval bases would be destroyed instantly; great factories, the arsenals where munitions are manufactured, would be wrecked in a jiffy.

So it is not too much to say that, if one nation had superiority in the air and another nation had tremendous superiority on land and sea, the nation in the air might win the war and win it in less than no time, because a government could be disarmed and the people would be panic stricken. Imagine, for instance, this country with no aircraft if war were upon us. Imagine, if you can, in the future that we might have the greatest navy in the world and the greatest army to be found in any land. Suppose the nation with whom we were engaged had superiority in the air and should come over our eastern seaboard, for instance, and destroy it. Instantly, because of the panicky condition of the people, demands would be made on the Gov-

ernment to sue for a peace that would be bound to be humiliating. The nation without air superiority could easily and might conceivably be thoroughly disarmed.

I said at the outset I do not desire wilfully to exaggerate the situation or the future of aviation but these things are, I think, easily discerned by anyone in the country. Speed is a tremendous thing, that is true. A speed of 270 miles is not now uncommon, and it is freely predicted that 400 miles an hour will be reached in 1931 or 1932 at the outside. I do not go into the higher realms of the air. It is an interesting speculation. The higher you go, the greater the altitude, the more rarefied the air becomes, and the less resistance there is to locomotion. The Germans in the World War took advantage of that situation with their Big Berthas in bombarding Paris from a distance of 75 miles.

We started a five-year building program in 1926. We took a tremendous step forward in passing the Air Commerce Act. That stimulated the industry everywhere. We have made great progress in the past year and a half or two years. But we also started at that time the five-year program for our Army, for aviation in the Army. By the end of that five-year period, 1932, we shall have 480 pursuit planes and we shall have something like 180 bombing planes, 75 amphibians and approximately 72 transport planes, and planes of various other kinds making a total of about 2,200. We shall have 445 in the Navy of all types running to about 25 in the Marine Corps; the Marine Corps has 67 planes of its own now but that is a small number.

There should be an airport in every city of this country, and everybody should do his best to make our country air-minded, our people air-minded, to the end that we may build up a big industry manufacturing planes, for it matters not how well we fly if we haven't the factories for manufacturing this equipment when we need it, we are fearfully handicapped with the rest of the world. The biggest thing America can do is to encourage civil aviation everywhere.



# CANADIAN AVIATION PROGRESS

**C**OMMERCIAL aviation in Canada has developed from what was apparently stagnation a few years ago, till today it is on a paying basis in nearly all branches. Air mail routes are being opened and passenger flying is common in the northern parts of the Dominion, and a great many of the city people are patronizing the air fields.

The real air-mindedness of Canada has come through the flying clubs which have been opened in the bigger cities from coast to coast. There are now sixteen active clubs in operation. This number is supplemented by others which have not yet obtained the government support of two De Havilland Moth planes.

It was this step by the government which has helped so materially in developing the air clubs. Provided a flying club can supply an adequate landing field or seaplane station; can take care of the housing, repair and maintenance of all aircraft and supplies granted to the club by the Department of National Defence; can procure the services of a qualified instructor and an aid engineer; and have a roll of at least 30 members who intend to fly and 10\* who have qualified to fly, the Department of National Defence grants the club two planes with engines, and will give one plane each year for five years if the club buys aircraft equal in amount to those supplied by the department.

The results of this policy are more than encouraging. The sixteen clubs had a membership slightly over 2,400 by the end of 1928. Approximate figures show Toronto has 250 members, Winnipeg 225, and Montreal 250. The other clubs are at Victoria, Vancouver, Calgary, Edmonton, Saskatoon, Regina, Moose Jaw, London, Hamilton, Ottawa, Windsor, Granby (Que.), and Halifax.

Figures on hours in the air indicate that Toronto leads with 1,203; Winnipeg is second with 1,003; and Montreal, third, with 946. A total of 8,150 hours had been flown by flying clubs at the end of the year.

On December 31st, there were 148 private pilots, 199 air engineers and 193 commercial pilots registered in Canada, as against 9 private pilots, 111 air engineers and 40 commercial pilots in 1927. Since some of

*By James Montagnes*

the commercial pilots allow their licenses to lapse if they are not flying in winter, the total number of commercial pilots who flew in Canada during 1928 comes to 250.

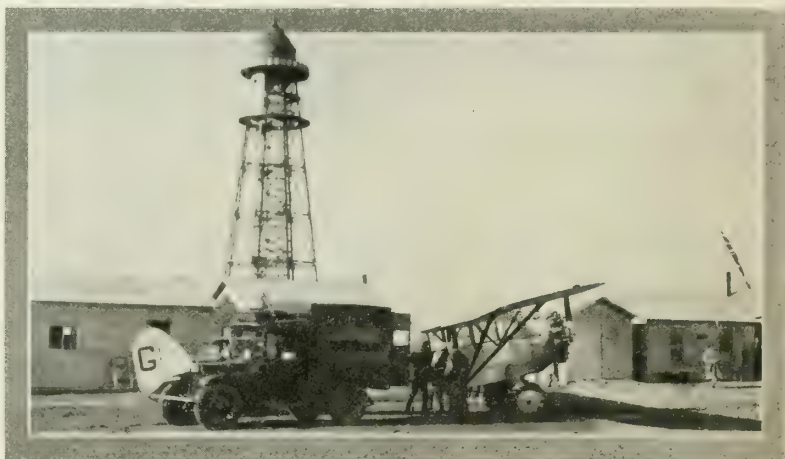
There were 44 licensed air harbors registered at the end of the year, while actually 56 air harbors are listed. This is a small number compared to that in operation in the United States, but it must not be forgotten that in Canada aviation, except in the east, is still confined to unsettled districts. In the northern parts of the Dominion any lake serves as an airport, for seaplanes are commonly used in the north, and such airports are not included in the number of air harbors.

There are but two airports listed in the Maritimes, one at Fredericton and one at Digby, Nova Scotia. There are quite a

partment of National Defence.

The Dominion Aerial Exploration Company of Toronto has a commercial seaplane station at Roberval, Quebec; Canadian Airways have one at Three Rivers; Fairchild Aerial Survey at Lac a la Tortue, and at Cap de la Madeleine; the Compagnie Aerienne Franco Canadienne, which is a branch of a French commercial air company engaged in surveying and photographic work for private concerns and provincial governments, has three seaplane stations in Quebec. There are in addition several other commercial seaplane stations.

In Ontario there are a number of fields at the cities. Toronto has four airports, all commercial. There are ten seaplane stations used by the Ontario Provincial Air Service throughout the province, Haileybury and Minaki in the north country have airports. London, Ford, Hamilton, Niagara Falls, Kitchener, Belleville, Ottawa, Port



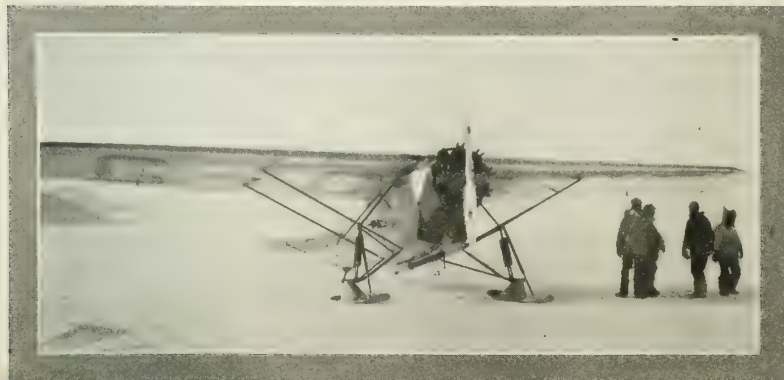
Transferring mail at St. Hubert Field, Quebec, near Montreal.

number in the province of Quebec, most of them being used by commercial companies. Montreal has St. Hubert Field, which is the main field with a mooring mast for airships, one used by the Canadian Vickers, Limited, a seaplane station in the Montreal harbor, and another commercial field. The St. Hubert Field is operated by the De-

Arthur and Windsor are the other cities which have airport facilities. In addition there are a number of seaplane stations in the north. Turning westward, there are 14 air harbors in the three prairie provinces. Winnipeg has three of these airports, while Moose Jaw, Lethbridge, Edmonton, Regina, Calgary, and Saskatoon have municipal airports. These cities also have commercial air harbors. Western Canada Airways have a number of seaplane stations throughout northern Manitoba.

On the Pacific Coast there is an airport at Victoria and at Vancouver.

Perhaps greatest progress this year has been along air mail lines. Up to this year there have been a few air mail services. These were mainly confined to the northland, where private companies flew mail in for 25 cents an ounce. Such a service is still operated in the Yukon between Dawson City and Whitehorse. The winter of 1927 saw a number of services inaugurated which brought mail to inhabitants of remote settlements, principally Pelee Island, Lake Erie; Magdalen Islands off the Maritimes



Ski-equipped Fokker of the Hudson Straits Aerial Survey at Wakeham Bay.

in the Gulf of St. Lawrence; and to Seven Islands and Anticosti Island in the St. Lawrence. Having proved successful, these services are being operated again this winter.

But development along air mail service for the average citizen has gone ahead this year. There were no services at the beginning of the year. There are now regular services to meet all incoming and outbound European boats landing at St. John in winter and Montreal in summer. These services started in May. Mail for the west, Toronto, Ottawa and Montreal, is cleared from the boats at Rimouski, on the St. Lawrence River in summer. The mail is flown to Montreal, where it is put in planes for Ottawa and Toronto. This service has saved twenty-four to forty-eight hours in delivery of European mail. Outgoing from Canada it has saved as much as eighty-five hours in delivery to England.

Including the western and northern services and those to the isolated places mentioned, the air mail total for the year was 283,163 pounds.

Starting October 1st, Canada inaugurated



Dominion Exploration Company's Fairchild at The Pas after a flight from Hudson Bay

Sunday) service, and had carried 30,660 pounds up to the end of 1928.

A survey by officials of the Royal Air Force was conducted across the western part of Canada this autumn to map future air routes and air mail lines. Services between Toronto and Winnipeg are contemplated,

is Northern Aerial Minerals Exploration, Ltd. During the past summer, this company, with airplane and boat, distributed 50,000 gallons of gasoline and enough food in places to last for two years, across the Barren Lands, from the east coast of the Hudson Bay to the Yukon, and as far north as the Arctic Circle establishing 25 caches. Without the plane, the same work could not have been done in less than five years. It was done in five months.

Another similar company, Dominion Explorers, Ltd., also operated in the Hudson Bay country to north of the Arctic Circle with four planes and a large number of prospectors, making rich strikes.

Western Canada Airways is perhaps the biggest transport company in Canada. It has 28 planes, including trimotored Fokkers and De Havilland 61s.

Fairchild Aviation, Ltd., one of the oldest air companies in Canada, mainly engaged in photography, covered 2,130 square miles of vertical photography, 3,000 square miles of oblique photography and sketched 5,000 square miles during the year.

On June 30th, 1928, there were 134 planes registered in Canada for commercial purposes. At the end of 1928, 264 planes were registered.

Ninety per cent of the commercial planes in Canada are of American manufacture. Government planes are fifty per cent British and fifty per cent American. Canadian made planes are still few in number. A twenty-seven and a half per cent customs duty has to be paid on all imported planes. Each machine has to have a certificate of airworthiness from the Director of Civil Aviation.

The Fairchild is made in Canada at the plants of the Canadian Vickers Company at Montreal. The Canadian Vickers also makes its own models at the Montreal plant, having a reciprocal arrangement with the American Fairchild Company.

The Wright engines are made in Montreal by the Canadian Wright Company, and the Pratt and Whitney will be manufactured in Longueuil, Quebec (near Montreal).

Toronto has an assembly plant for De Havilland airplanes. Ottawa has a plant for the assembly of Armstrong Siddely engines, and the Cirrus engine is also represented in the Dominion.



A Western Canada Airways plane at Brochet Settlement, Reindeer Lake.

a regular air mail rate; namely, five cents for the first ounce, and ten cents for each additional ounce. Canadian air mail postage will carry over United States air routes, and vice versa.

With the arrival of a flat air mail postage rate came a daily week day service between Toronto and Montreal, one plane each way per day. 17,348 pounds were carried on this route during the three months the service operated in 1928. Canadian Airways, Ltd., a subsidiary of the International Airways, Ltd., operates the route.

A weekly service between Ottawa and Montreal operated by Transcontinental Airways, was also inaugurated at the same time. The service is in connection with the boat services to Rimouski in summer and St. John and Halifax in winter. The inaugural run from Ottawa to Montreal carried 25,000 letters.

A connection with the United States air mail services was let by contract to the Canadian Colonial Airways. It runs from Montreal to Albany, where it connects with United States lines. It is a daily (except

and if started, will mean the first night flying in Canada. A service between Toronto and Windsor (opposite Detroit) will open shortly. Another service was in operation by the Western Canada Airways between Winnipeg, Regina, Edmonton, Saskatoon and Calgary, from December 10th to the 29th. Seattle and Victoria operate a regular mail service. Another route is in operation from Montreal to the Maritimes.

Connections with the United States will also multiply, Toronto-Buffalo and Winnipeg-St. Paul routes being now under serious consideration.

The number of commercial air transport companies has grown during this year from 21 at the end of 1927 to 54 at the end of 1928. There have been several amalgamations.

A number of mining companies operating planes for their own personnel have sprung up during the year, as well as more transport companies engaged only in flying prospectors and supplies to the mining fields in Northern Canada. One of the outstanding mining companies to operate its own planes



# GROWTH OF AIR MAIL SERVICE

WHEN the Post Office Department established the first air mail route and took upon itself to demonstrate that the transportation of matter by aircraft was feasible and entirely practicable from the standpoint of private operation, it had no intention of creating a profit-making institution within its own establishment. It was engaged in a pioneer movement—a movement that had no precedent in its means or method of operation; that was not bound by centuries of established practice but was to establish itself as a new means of communication between the people of this country. The lessons of the war had impressed themselves upon the minds of those engaged in this work and it was only proper that the Post Office Department should be the agency through which the peace-time objective of this newly made creature of war should be attained.

It was but natural that this fast means of transportation should be adapted to the carrying of mail. There was not a great deal of encouragement to be had; aviation was something new; its commercial possibilities were unheard of and untried; capital was lacking, banking houses fought shy of investing funds in such enterprises; there were no commercial routes in this country; the ambition was there but there had been nothing to prove that aviation was commercially sound. It was an unknown quantity and there was but one agency that could demonstrate its possibilities, and that agency was the Government of the United States. The Post Office Department was the one instrumentality of the government through which such a demonstration could be made.

Beginning with daylight flying at first, the Department experimented with different types of night lighting equipment, with the idea of arranging to fly mail from the Atlantic to the Pacific coast over a transcontinental route and at a time during the 24-hour period when the usual mail load was moving. At first its work was discouraging; experts predicted that night flying might be possible but that it was not practicable; "it was unsafe and out of the question" so they said.

Persevering in its determination to prove the fundamental principles of its object, the Department established a lighted airway, first from Chicago to Cheyenne, later extending it from New York across the country to Salt Lake City. From what was first a relay service between plane and train across country there grew a continuous flight, supplemented by night service between New York and Chicago. The Department lent its aid and approval in drawing up

By  
Hon. Harry S. New

*Postmaster General*



Hon. Harry S. New

a measure in Congress whereby it would be possible to contract for the carrying of mail by aircraft; it fostered amendments to the bill which would simplify and speed up the handling of air mail and also to extend the life of the contracts and provide for a periodical adjustment of rates fair to the contractor and the Government alike.

From all this there has come the present network of air mail routes through this country. Flying day and night, through the snow and over the frozen ground of the north and down through the palm bordered lanes and orange groves of Florida and California, the air mail routes now

operate day in and day out 24 hours a day. Twenty-three routes are flown within the borders of this country, serving over 100 of our larger cities, carrying an average of 7½ tons of mail each day and flying in excess of 30,000 miles daily.

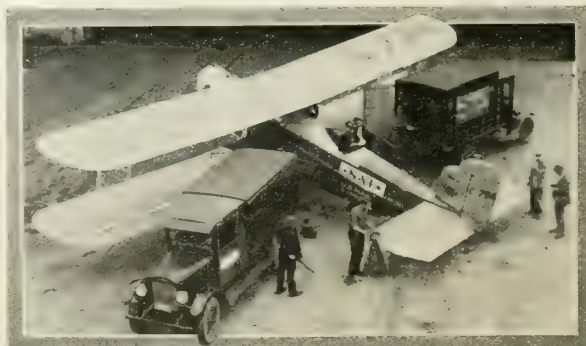
Perhaps with pardonable pride I might touch upon the subject of our foreign air mail routes. With the line from New York City to Montreal, one from Miami to the British possessions in the Bahamas, another to Cuba, Haiti, Dominican Republic and Porto Rico, we are about to establish a route to the Canal Zone, touching at the larger cities in our sister republics of Central America to the south of the Rio Grande. We are bringing into closer contact the peoples around us and thereby closely cementing their friendship and sharing

their commerce, trade and industry through this medium of fast transportation.

An air service that shall carry our mails down the Pacific Coast to all the South American countries is being arranged for and I believe will be a consummation of the very near future.

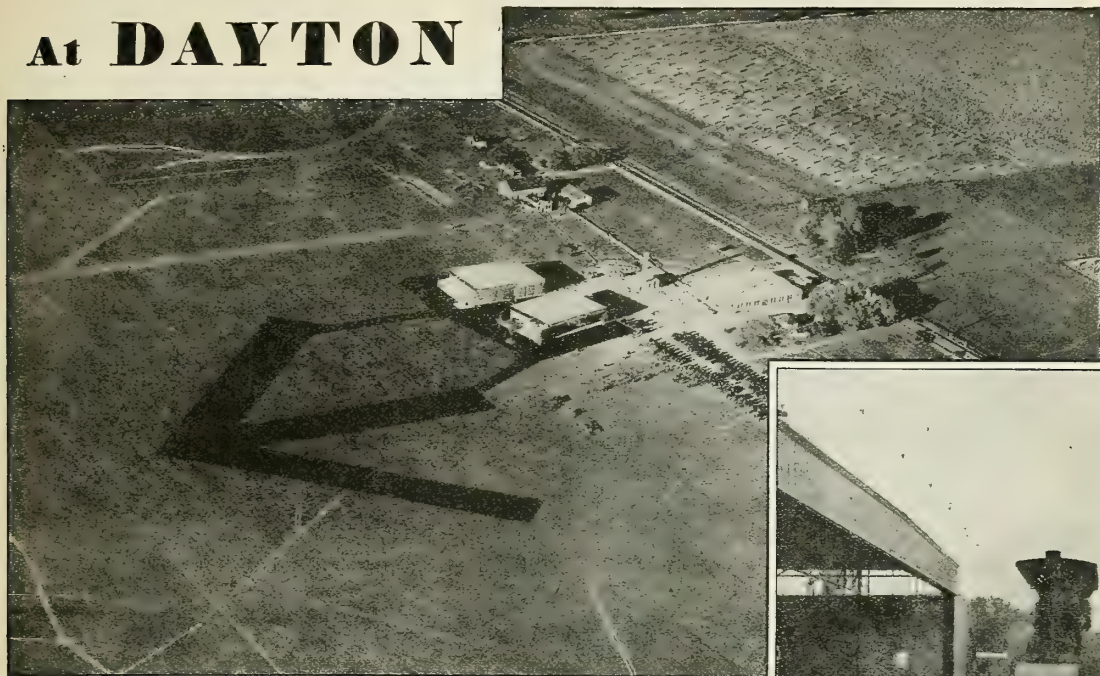
Assuredly the work already done has extensively contributed to the progress of our commerce, welfare and happiness. It has demonstrated the practicability and far-reaching possibilities of commercial aviation. It has established the industry on a permanent and prosperous footing in the United States and has placed it in the forefront of the accomplishments of the twentieth century. The possibilities of future development cannot be foreseen but they are great and we must prepare to avail ourselves of them.

One thing we know and that is that foreign governments of major importance are investing their money in the establishment of air mail lines to South American countries, for instance, for the purpose of capturing their trade. The United States must meet this competition or abandon all that commerce to others more enterprising. The American spirit must lead the world in establishing international communication.



Loading air mail into a National Air Transport plane.

## At DAYTON



### *Tarvia paves the way into and out of the sky*

**F**LIERS in and out of Dayton are enthusiastic about the ease with which take-offs and landings are made at this modern airport. The smooth, resilient, mudless, dustless, frost-proof, non-skid Tarvia runways are safe in any weather.

For more than a quarter of a century Barrett engineers have been experimenting—working—accumulating information on all phases of pavement engineering. Their experience has taught them how to utilize local materials—how to cope with local difficulties—to effect real savings.

Airport engineers will find this information, accumulated from first-hand experience in road building, of definite value to them in the solution of their problems.

The Tarvia man will be glad to discuss details with you. Phone, write or wire our nearest office.

**Tarvia**  
For Road Construction  
Repair and Maintenance



*No effort has been spared to make the Dayton Airport (upper left) one of the most modern and complete airports in the country. The photo above shows the Tarvia apron facing one of the Dayton hangars.*

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# PERSONALITIES



by Caldwell

THIS beautiful picture of what the well-dressed airman will wear was posed especially to give a delicate touch of "IT" to this department for the benefit of our two young lady readers. It was posed, at enormous expense, by Pilot Dudley M. Steele himself (in person) and strikes just the right note of *tout ensemble*, or *chic*, or shall we say *bonhomie*. There is a nonchalance, a verve, as it were, about this creation that is really fetching. Personally, as a critic in matters of dress, I should prefer a ruching of fillet point lace about the collar. But then, one cannot have everything, can one? The jacket, from the studios of Lady Duff Gordon, is of mole-skin; the breeches, by Hobbs of London, are of buckskin; the boots, by Squeezem of Piccadilly, are of cow-skin. Helmet, by Spaulding, and goggles, by Meyrowitz, add the final toot to the *tout ensemble*. The cigarette, I regret to announce, is an ordinary Camel. It should be a Murad, cork-tipped and scented. An unscented cigarette adds a jarring note that grates upon my sensitive esthetic sense. Still—lack-a-day! One must suffer.

In addition to being a delight and an ornament to his profession, Dudley Steele is also a very useful working member of it as pilot in charge of aviation and salesman for the Richfield Oil Co. of California, whose kindness in putting up \$25,000 to underwrite the prizes for the National Air Races in Los Angeles will be recalled. The Richfield company has a trimotored Wasp Fokker and an OX-5 Waco, and is getting a Whirlwind Stearman—a plane that Dave Levy insists is the best in the world. Still, Walter Beech says the Travel Air is, Alexander says the Eaglerock is, and Bob Moore says the Loening Amphibian is. So that leaves us just where we were before. Bob calls his Loening the Aimee Semple McPherson—because it can take off from the sea and land in the desert. That's a hot one, eh?

But I'm wandering away from Dudley, who (I'm sorry to admit to you two girls) is married. He's 36 years old, too. And there's a closed season on all bucks over 36. If there isn't, there ought to be. Which reminds me: I was out deer-hunting with a widow this fall and I told her to shoot only a buck, upon which she laughingly rejoined, "To hell with the buck—what I'm after is the dough!" You can't beat those widows, can you? But getting back to Dudley—and I really should get back to him, and not go wandering around like grandfather's goat, or where will my dizzy literary reputation be?—good old Dudley took his maiden flight with Lieut. Harmon, now Air Corps attache at Paris. That was in 1916, before he got the *tout ensemble*, you know. And before Roscoe Turner got his uniform. Away back, befo' de wah, as Elliott White Springs says. The day war was declared, forth leaped the bold Dudley

and enlisted pronto. He learned at Ellington and instructed at Brooks and Scott. There must have been something wrong with him, for after the Army had him well trained they turned him and 17 others over to the Navy to learn seaplanes and boats. Apparently the old boy had been a trifle heavy on the Jenny. That's what I gather. Or perhaps he was a good swimmer. But the idea was to train these 18 lads and send

them as an Army Coast Patrol Squadron to the Black Sea. However, the late enemy—doubtless learning through spies that Dudley was on the way—gave up and went back to Berlin. Upon which Dudley was hurled out to fight the high cost of living, along with the rest of the Army.

He immediately started to organize things. He had run the Flying Meet at Scott Field in August, 1918, so what more natural than that he should run the Kansas City American Legion Flying Meet in 1921, and help with the Pulitzer Races at Selfridge Field in 1922. He was on the original N. A. A. contest committee in 1922, until they found out what was wrong with it, when he flew or fled to California and promoted Around the World Flight memorial races in 1925, '26 and '27, which gave him good experience that he used to advantage as Chairman of the National Air Races in 1928, when the Richfield Oil Company loaned him from December, 1927, to September, 1928—a very sporting thing for them to do. Incidentally, he was the bird who went to the various cities and pried loose the lap prizes, for which he is still awaiting his first letter of thanks from the pilots who won that money! Dudley, virtue is its own reward. Undaunted by this lack of appreciation, he has bought this new suit and is working to stage a Transcontinental Air Classic, based on speed, efficiency, and economy. I hope he works out a formula that will prevent certain lads revving Whirlwinds at 2,100 per minute, and burning them out, in the pious endeavor to make them, with their 220 h.p., do what it takes 300 h.p. to accomplish. If you can do that, Dudley, you will be conferring a benefit on sane aviation.



Dudley M. Steele

ONE of the mysteries of the last air races was how Pilots Stuart F. Auer and Robert C. Herron managed to wrap their Waco around a flock of high tension lines carrying 33,000 volts of perfectly good electrical energy over the desert some forty miles east of Yuma, Arizona. One story goes that they were having a forced landing and failed to see the lines, on account of having to land with the sun in their eyes—with the result that the Whirlwind went on about 100 feet farther than the rest of the plane. A malicious rumor, obviously manufactured by enemies, whispers that the boys came down to wave at two pretty girls who were driving along the highway in a car, and that they were so interested that they didn't see a thing ahead of them. I'm sorry that such a rumor should get about, and I'm doing all I can to discredit it. They were waving at a lizard. However, Stuart and Bob are back in Milwaukee, where they will spend a long hard winter explaining to their respective wives that this rumor is untrue. If the winter is long enough, they'll succeed.

(Continued on next page)

# 17-year-old girl sets flight mark using Kendall Penzbest Oil



ELINOR SMITH  
33 NASSAU AVENUE  
FREEPORT, NEW YORK

February 1, 1929

Kendall Refining Co.  
Bradford,  
Pennsylvania

Gentlemen: Attention: Mr. I.H. Shearer

No doubt you will be glad to learn that I used Kendall Penzbest Oil on my flight yesterday during which I established a solo endurance record for women.

On this flight as well as many others I have made, including my altitude flight, I have used your oil with the most satisfactory results. The weather was intensely cold during the flight but the motor functioned perfectly and I feel Kendall oil helped me immensely.

It does not seem to make any difference if the weather is hot or cold as your oil stands up under wide open throttle on a hot day and starts without any difficulty when it is cold.

There is certainly a feeling of satisfaction when I know that Kendall is in my motor and it has helped me demonstrate many times that aviation is just as safe for women as it is for men.

Sincerely,

ES/B

*Elinor Smith*



## ELINOR SMITH

says Kendall Penzbest helps to make aviation safe for women

Fighting bitter cold and high winds over Long Island for 13 hours, 16 minutes, 45 seconds, Elinor Smith of Freeport, Long Island, established the world's endurance record for women's solo flying when she stepped from her Brunner-Winkle Bird Bi-plane after landing at Mitchel Field at 3:33 a. m. January 31, 1929.

"This plucky girl who also achieved a women's altitude record in August of last year, graciously gives credit in the letter reproduced here to the part played by Kendall Penzbest Oil in helping to make her flight a success. In expressing her opinion of Kendall Penzbest, Miss Smith does so as one who knows its ability thoroughly and who has used it consistently throughout her brilliant career as a pilot.

The superior quality of Bradford Grade of Pennsylvania crude from which Kendall Penzbest is exclusively refined, the thorough methods used in its refining, the ease with which it flows the instant the engine is started and its effectiveness at high operating temperatures, furnishes the performance so necessary in tests of speed and endurance.

Kendall Penzbest Oil is deservedly the choice of winning pilots everywhere. It is helping to make aviation safe for women — safe for all. For a list of airports where Kendall Penzbest is now obtainable, address Aviation Division, Kendall Refining Company, Bradford, Pa.

# KENDALL PENZBEST MOTOR OIL



REFINED FROM 100% BRADFORD  
GRADE OF PENNSYLVANIA CRUDE



(PersonAIRlities continued)

THE worried looking gentleman in the leather shooting-jacket is Pilot J. H. DeCelles, Assistant Instructor at the Alexander Aviation School at Colorado Springs.



J. H. DeCelles

That's probably why he looks so worried. It's bad enough being an Instructor, but when you're an Assistant Instructor, that means you do all the instructing, and you get the very toughest ones to instruct, too. The pupil with the low, retreating forehead, with hair growing right down to the eyes, is the one that gets turned over to the good old Assistant, as I know to my sorrow from the war days. I had the great good fortune of being a Lieutenant in an instructional flight with two Captains, who naturally got first pick, which I think accounts for the number of the halt and maimed who drifted along to me. I had one bird who had been a pupil for practically the duration of the war. He was what you might call a professional and perpetual pupil. Every instructor had taken a crack at teaching him. He was related to some big bug in the Army who didn't want to see him shoved into the infantry, so despite three medical boards, and my own fervent recommendations, he was still with me when they went and signed the Armistice on him. If the war had only kept on four years more, I do believe I'd have got that baby solo. Or I'd have had him nearly ready for solo, anyhow. And in time, of course, he would have died of old age, so I'd have got rid of him in the end, even if I had to entice him to a dock some place, and shove him off.

But that just goes to show why Assistant Instructors never smile. De Celles gets a rest occasionally by ferrying ships, but when he comes back he finds they've rung in three more duds on him, so the rest doesn't really do him much good. By the way, he's a cousin of Moisant, that old-timer who held the World's Altitude Record back in—I forget the year, but the record was some 4,000 feet, if I remember correctly. So it must have been around 1910 or so.

A REPORTER on the *Sacramento Bee* arrived at the airport with a pint of high-powered moonshine in his hip pocket and perhaps a quart inside him. Thus equipped, he crawled into Leo Moore's Travel Air, just as Leo was about to take off with a parachute jumper named Bass, who was to do a drop. The reporter assured Bass that he would give him a drink when next he met him on the ground.

On the way up, this reporter hoisted a couple, just to keep himself in good humor, then stuck his head over the side and watched the bold Bass leap into space. As Bass fell and fell, and still kept on falling, the writing gentleman decided that all was

over but the obituary notices. Greatly shaken, he sat back, tilted his flask, and drained it to the last drop. Then, refreshed and strengthened, he got out his paper and pencil and had the story of the accident half written by the time the plane landed—when he was absolutely staggered to see Bass walking toward him, with his parachute under his arm.

"How about that drink?" asked Bass. "I could stand one right now."

The reporter shook the empty flask. "Sorry," he muttered, "but I didn't think you'd need a drink where you had gone."

TED BURKE, who is in Washington with the Progressive Flying Service, gives us the lowdown on Hank Poindexter's field at Raleigh, N. C., which Hank told me was a very good one. Ted confirms that report, in these words—and if he's wrong, Hank, why you just sue him:

"Hank has a pretty good field there about the same as the rest of them only maybe a little bit better. Speaking of the field at Raleigh, Stinson came in there last Winter, and through the press he told the city not to mark the field for fear that some unsuspecting pilot might come over the town and take the markings to mean that it was an airport. So you can draw your own conclusions. If you know anybody who is seriously thinking of going down there tell 'em to watch the trees on the south and west, the wires on the north, and the nigger school-house on the east. Otherwise it's a damn good four-way field. Well, I wish Hank luck. He'll need lots of it if my experience is to be taken as a barometer."

I WAS sitting in my room at the Statler in Cleveland the other evening, when in walked David Pearce Levy, the Abie's Irish Rose of aviation. He's a racial conundrum or cross-word puzzle to me. He's half Jewish and half Irish. He got some instruction from a rabbi, then went to a Catholic school for a time, with the not unnatural result that he is now a full-fledged atheist or agnostic, I don't know exactly which. All that differing theology simply wouldn't mix. How could it, anyhow? Now, I can sympathize with a boy as mixed up as all that, because I'm quite a mixture myself. Back for four generations I can number Scotch, Irish and English among my ancestors on both sides, which seems to make me, roughly, one-quarter Irish, one-quarter Scotch, one-quarter English and one-quarter alcohol. The percentage of alcohol may be slightly higher, especially during air races.

Levy learned to fly with the late Kenneth Montee, in 1923, at Los Angeles; after which he flew for Wm. S. Brown in Fresno and for Cloyd Clevenger in St. Louis. In 1926 he ferried a flock of Wacos one after the other out to California for the American Aircraft Co. And since last February he has been test pilot for Stearman Aircraft Co. at Wichita, Kansas, home town of

Carrie Nation. They have a monument to Carrie in Wichita. Three years ago when I was there I stood reverently before that monument, took out my pocket flask, and drank to her memory. It seemed the fitting thing to do.

PILOT EDDIE NIRMAIER, formerly of the wind-swept metropolis of Miami and now of the unswept village of New York, grows thoughtful and troubled, as follows: "For the past two or three years I've notice articles in newspapers and aviation magazines assailing stunt flying. Just what do they mean? If they mean diving at a crowd, looping at 300 feet, spinning down to 50 feet, or in, or zooming over houses, I agree with them. They ought to put the pilot in jail. On the other hand, I wouldn't have a pilot that couldn't stunt a ship. I find that the majority of pilots who crab about stunts cannot stunt themselves, and I believe that any pilot who cannot stunt is not the same pilot as one who can. I believe that a pilot should be taught stunts, not for the spectacular part of it, but to teach him recovery from unnatural positions. I find that the pilots who can not stunt may be excellent pilots while everything runs right, but let the motor quit, or let them run into a little bad weather, and they don't know what it's all about. Stunts are all right when they are done at proper altitudes. Although I don't very often get in a ship that can be stunted safely, when I do get in one I like to brush up a bit. And I don't think much of the new production light ship for stunting unless provided with four extra pairs of wings."

Well, Eddie, I agree with you that every pilot should be taught to stunt, and also that when he is in a ship suited to stunting he should brush up a little—and the higher up, the better. Personally, I have done no stunting for several years: for one reason because I don't enjoy stunting, and for another because I have not been flying ships that I considered suitable for stunting—though other gents stunt those same ships with glad cries. Here are a few items on stunting—and then you write your own ticket:

Not long ago I watched two boys at Roosevelt Field dive in an old commercial plane. The wings came off. A little later at Cleveland two boys dived in a fairly new production ship and pulled out too quickly—wings off on that one. Then I watched Lieut. Williams of the Three Musketeers fly on his back, near the ground, crash, and kill himself at Los Angeles. Two weeks later another member of the Army's Musketeers, Lieut. Cornelius, while flying in close formation and stunting, collided with another plane. Pilot killed. Now, Eddie, I shall never be able to stunt as well as either of those two Army pilots could stunt, for I don't intend to practice at it. But, Eddie—I'm still here. And although something conceivably may happen to me some day, I'm not going to ask for it. So you write your own ticket, Eddie.



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Airplane Nitro-Valspar answers the ever increasing demand for color and extreme durability. At the same time it solves the problem confronting manufacturers who find essential a finishing process which insures speed production.

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# TEXAS AIR TRANSPORT

MR. A. P. BARRETT, who was the president of several electric light companies in Texas, New Mexico, Arizona and Louisiana, about eight months ago bought the controlling interest in the Texas Air Transport. Since that time Texas has not looked back.

Mr. Barrett soon recognized that, if the gospel of safe and sane flying as it is today was to be spread, the reporters of the state newspapers and the officials of the chambers of commerce must first be educated to flying facts. For this purpose he arranged a guest-student course for Texas reporters and city officials. Over forty men in all walks of life attended the two-day course which was arranged in the Theory of Flight and the Nomenclature of Aeronautics. The result was that the newspaper reporters learned the right way to write a newspaper story on aviation; they learned that a crash is not

By Capt. W. H. Scott

be erected to house and take care of the men. All these schools will be in operation by the beginning of March, and instruction will be given every day of the year. Students will be trained by air mail pilots operating air mail routes CAM 21 and 22. The machine shop work will be given by experienced engineers of the Texas Aeromotive, Inc., a subsidiary company of the T.A.T. Curtiss Robins, with dual controls, Travel Air, and Swallow planes will be used for flying instruction.

Within the next three months passenger airplane lines will be commenced over the following routes: (1) Texarkana to Dallas and Fort Worth; (2) Dallas and Fort Worth to El Paso; (3) Dallas and Fort Worth to Amarillo; (4) Dallas and Fort

Wright engines and parts, Pioneer instruments, Stromberg carburetors, AC spark plugs, Standard steel propellers, Goodyear tires, Meyrowitz goggles, and many other nationally known airplane materials and parts.

When asked why he took up aviation, Mr. Barrett said he had been studying the commercial possibilities of aviation for many years, and more so since he sold the government part of his land for the first army flying field at San Antonio, now Kelly Field.

To this man, aviation is a business that must be sold like power and groceries, and for this reason, he has gathered round him some of the finest aviation experts in the South. Among them are Tom Hardin, vice-president and general manager; Robert Smith, formerly aviation secretary of the Dallas Chamber of Commerce; Silliman Evans, vice-president and director of public relations; H. G. Barrett, vice-president; C. R. Smith, treasurer; Jerry Marshall, veteran commercial pilot; Homer Rader, chief pilot; H. B. Taylor, general manager of the parts and service; and E. G. Rhenstrom, formerly associated with Fairchild Airplane Mfg. Corp., in charge of operations.

Tom Hardin is a veteran pilot who took his first air instruction in 1916.

He worked for six months drawing up the charter and arranging the details of the bid by which the company procured the Government contract to carry air mail in Texas. He later assisted in making the contracts to carry international mail between Mexico and the United States. He also had the honor to carry the first air mail



Texas Air Transport officials. Left to right: Evans, Smith, H. G. Barrett, Hardin, and A. P. Barrett.

always a crash, and that aviation as a profession is entitled to have facts fully explained in order that the general public may understand them. Prizes were offered for the best newspaper story on the school.

The guests were given rides by Jerry Marshall, chief pilot for the T.A.T., Homer Rader and Bryan Robbins, air mail pilots. Lectures were given by H. B. Pentland, Department of Commerce; Tom Hardin, manager of the T.A.T.; Jerry Marshall, and others of the party. In his talk, Marshall introduced his audience to the theory and science of flying, carefully detailing what happens to a ship, or pilot, under most every condition that arises in the air. He explained fully the causes and results of tail spins. He was also careful to point out that, in 99 cases out of 100, the ship is not responsible for an accident.

Every night the newspaper men sent telegraph reports of their progress at the school, and the published stories were carefully checked by Tom Hardin and Silliman Evans.

Mr. Barrett's entrance into Texas aviation proves that the dynamo of business ability, that will not be deterred by any setback, is the secret of progress. At present the T.A.T. has in course of construction four large hangars at Fort Worth, Dallas, Houston, and San Antonio, for the purpose of training flying students. Barracks will later



Mail plane of Texas Air Transport at Fort Worth Airport.

Worth to San Antonio and Laredo; (5) Dallas and Fort Worth to San Antonio; (6) San Antonio to Corpus Christi and Brownsville; (7) San Antonio to Houston; (8) Houston to Dallas and Fort Worth. The South Texas lines leaving Dallas and Fort Worth will go via Waco, and the line to San Antonio will go via Austin. Altogether with the air mail lines, Mr. Barrett will be operating ten separate air-lines in Texas. Exclusive of air mail, the passenger carrying ships will travel 5,130 miles per day.

Moreover, at each station there will be agencies for Curtiss planes and engines, all seven models of the Travel Air planes,

to Mexico City from the United States.

Robert Smith, traffic manager, will long be remembered as the man who made the city of Dallas buy two airports.

Jerry Marshall is known throughout the country as one of the veteran commercial pilots and air mail carriers of the old school.

The first flight of Texas Air Transport was made February 6th, 1928.

At the conclusion of its first year of operation, Texas Air Transport had carried 84,050 pounds of mail and had covered 511,918 miles. The recorded flying time was 5,489 hours. During that period neither passengers nor personnel suffered a single injury.



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*with*

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EVERY manufacturer concerned with the finishing of metal surfaces on airplanes owes it to himself to know the complete facts about Murphy Aircraft Sanding Primer.

On "dural" and other clean metal surfaces, instead of a priming coat, a surfacing coat and a ground coat, you can now do what *all* of these three coats do by using the one material — Murphy Aircraft Sanding Primer. And further than that, you do not require a sealer.

The great saving in time, labor and money in such a procedure is too obvious to require going into details.

A few notes on this remarkable new material follow:

It dries hard overnight.

It has unusual adhesive quality.

It sands with great ease to an extremely tough, compact surface over which either lacquer or enamel may be applied.

It has an oil base and is very heavy bodied.

It is to be reduced to spraying or brushing consistency with turpentine.

It is furnished in red, gray, white and black.

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### MURPHY FINE FINISHES



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Aircraft Enamel



# AIRPORT AND AIRWAY

*News of airlines, airports, and airways; radio, lighting and other auxiliary services*

## Laying in a Stock of Trouble

ON every hand, we witness high pressure growth of airport and airway. Cities by scores announce airports; new air lanes develop in an amazing succession; the new routes of today become the established airways of tomorrow. The sun has risen on a busy field of activity and an enthusiastic public support spurs our growing industry to greater expansion.

The conservative and the pessimist is always unwelcome in a merry parade of progress. With everything moving along so happily, why strike a discordant note of caution or find flaws in the forward marching cordon of progress?

During the formative period of every industry, trends develop which ultimately hinder future growth. Witness a recent example, the confusion in allocation of broadcast wavelengths, the direct cause of failure to look ahead during radio's period of mushroom growth. The excess of stations on the air has brought an instability to the economic position of every broadcasting station, with the result that more than half the programs on the air are of mediocre quality and acceptable entertainment is found on but a few of the many dial positions at which stations are heard. A complex fight for places on the air harasses an overburdened Federal Radio Commission. A little foresight exercised a few years ago would have prevented confusion and forestalled the creation of a wellnigh hopeless problem.

Perhaps the form of organization adopted for the management of our airports is establishing trends which will later prove embarrassing. Most airports have sprung up as products of civic pride in the form of community projects. Commendable foresight has been displayed in standardizing airport

By  
Edgar H. Felix

design, and regulation by the Department of Commerce has, in a large measure, prevented the construction of unsuitable airports. There is no outward cause for alarm; indeed, we can congratulate ourselves on the benefits of wise direction and intelligent planning which have accompanied the embryonic days of air traffic development.

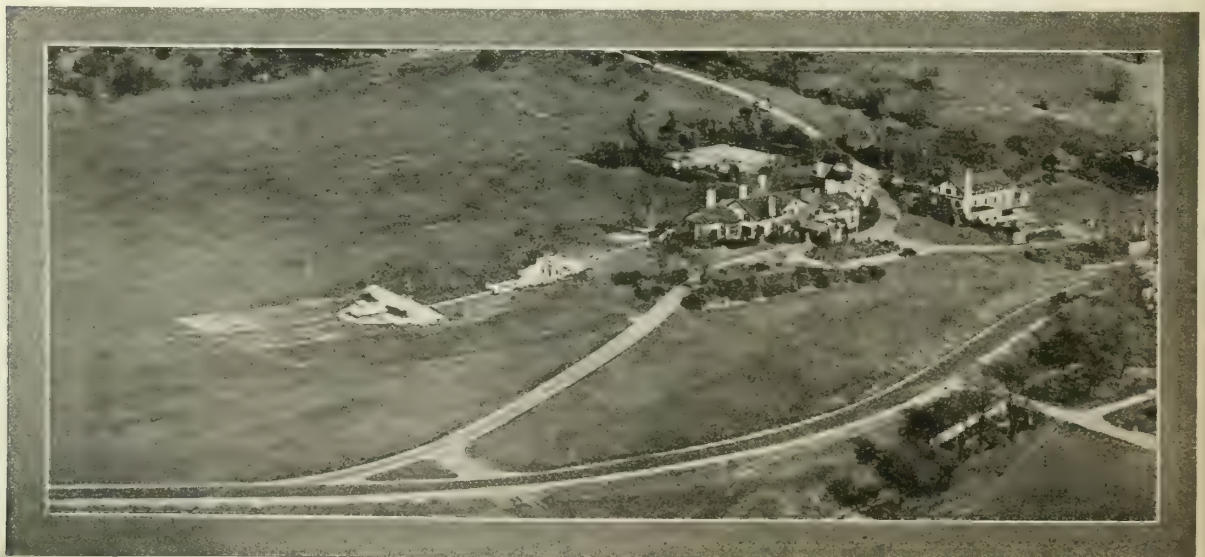
The problems which I foresee will not arise until we have real airport traffic congestion. It is no stretch of the imagination to predict a hundredfolding of the number of transport ships arriving and departing from all of our airports. Instead of one or two planes a day between key cities, planes will leave on half hour schedules. When every important city of the country is within overnight travel distance of every other city in the land, air passenger traffic will increase enormously. It will not be a question of what proportion of rail passenger traffic will be diverted to the air; there will be a vast increase of travel for personal and business contact which will be the direct product of easy and rapid aerial transportation. Communities within commuting range of large centers are today sending thousands of people to work daily by train, the same communities, one-third of whose residents, fifty years ago, journeyed to that same city but once in a lifetime. In the same way, air transport will build up an entirely new demand for travel, a demand which is non-existent today because of the comparatively slower speed systems of transportation now available. We do not realize that less than ten per cent of the residents of New York State have been in California; fifty years

from now, because of the airplane, the number may easily rise to fifty per cent. We are optimists about air travel, but there is no one with sufficient vision today to be able to predict the revolution that stabilized air travel will create in our daily lives or to estimate the vast numbers who will use aerial transport annually in the future. Did we have an accurate vision of what lies before us, would the present trends in airport and airway development be modified?

We are pleased to consider the pathways of the air as carefree highways without boundaries and restrictions. But, with the enormous traffic of the future, will not the airway be as accurately demarked as the steel rails which guide the express train on its course so as to provide traffic regulation, communication and safety to those on the ground below? Are airports being so planned and located that they will be able to serve the heavy traffic of the future? Is the independent municipal management of airports the ideal system for what must of necessity become a unified and coördinated system of transportation? Are not the requirements of private flying entirely different from those of commercial traffic routes, and should not separate airports be provided for private and instruction purposes? Is the present development of an independent radio communication system for each airport and airline a desirable trend? Are we not heading for serious confusion and congestion because of uncoordinated management of airport and airway?

Ultimately, I believe all landing fields of each particular airway will be under a single management so as to cope with the developing problems of air traffic direction and control. Maintenance of airways will become

*(Continued on next page)*



The estate of Col. E. A. Deeds at Dayton, Ohio, with metal airplane anchorage within a few steps of the residence.



# AIRPORTS

**A**IRPORT Development & Construction Company brings to American cities and to the aviation industry a comprehensive airport service within one organization.

Airport planning and construction.  
Consulting service in site selection, layout, design, grading, drainage, surfacing, lighting, and equipping.

Design and construction of hangars, shops and airport structures.

The aim of this organization will be to meet most economically the present needs of aviation, while at the same time visioning the requirements which will accompany the future growth of the industry.

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Formerly Manager Airport Equipment Division, Maryland Metal Building Company

### THORPE NESBIT, Esq.

Weill, Blakeley & Nesbit, Attorneys-at-Law

### CHARLES A. GLOSE

Asst. Treasurer, Airport Development & Construction Company

**Airport Development & Construction Company**  
1620 Mitten Building, Philadelphia, Pa.



(Continued from preceding page)

as specialized a science as maintenance of highways or railroad rights of way. Dispatchers will guide airliners with radio control on split second schedules. Passengers will pour in and out of airports, connected by rapid transit systems with the cities they serve, and the whole nation will be welded into one great community by the conquest of distance. Private flying will transgress no more freely on the air transport lanes than do strollers on railway rights of way today.

The immediate need to prepare for this new age is the development of a coordinated system of airway radio communication. The second requirement is the unification of airport management so as to assure the smooth control of the heavy air traffic of the future. The management of airports should be organized with sufficient flexibility that the ultimate necessity for unified control of air traffic will not later impose too heavy an economic burden upon the aircraft industry.

#### Aircraft Radio Communication

**R**EALIZING the importance of adequate radio communication to commercial aviation, the engineering staffs of the Radio Corporation of America, the General Electric and the Westinghouse companies have applied themselves to developing suitable aircraft radio equipment of a character which can be standardized for a wide variety of airplanes. A 100-watt transmitter and receiver equipment, having a radio telephone transmitting range of about 150 to 200 miles, and a continuous wave telegraph range by daylight of 500 to 800 miles, is already available. The total weight, including wind-driven generator, is 86 pounds. The transmitter may also be powered by a dynamotor from the 12-volt lighting system storage batteries. The receiver may be mounted conveniently near the pilot. The transmitter is designed to operate on any fixed frequency in the wave band set aside for aircraft communication, between 2,250 and 2,750 kilocycles, equivalent to 133 to 109 meters. The Radiomarine Corporation, an R. C. A. subsidiary, has brought out a special beacon receiver with a wavelength range from 580 to 1,100 meters. It may, of course, be used for the reception of any signals in that frequency range. The radio installation may also be used for intercommunicating purposes between pilot, radio operator and passengers.

**T**HE Burgess Battery Company of Madison, Wis., has issued a booklet, "Experimental High Frequency Radio for Aircraft," describing battery-powered radio transmitters, designed at their laboratories. A complete transmitter and receiver are described, installed in the cockpit of a Travel Air plane. The transmitter occupies a space of 406 cubic inches and weighs four pounds. It is powered by A batteries, occupying 258 cubic inches and weighing eight pounds, B batteries occupying 533 cubic inches, weighing 26 pounds, making a total space for the transmitter of 1,197 cubic inches and a weight of 38 pounds. The receiver space totals 1,700 cubic inches and the weight 53

pounds. Life tests of the batteries revealed a power maintenance cost of \$1.05 per hour, or one cent per flying mile of radio operation. Under exceptional conditions, remarkable ranges were obtained, two-way communication being established with points throughout the State of Wisconsin, as well as several record exchanges with cities in Minnesota, Pennsylvania, Michigan and Ohio. The plane's signals were heard at points as far distant as Atlanta, Ga., while it was flying over Madison, Wis.

#### Airport Developments

**T**HE cost of real estate for twelve of the leading flying centers of the United States amounted to more than \$10,000,000, with St. Louis, with an expenditure of \$2,000,000, at the head of the list, followed by Chicago, \$1,850,000; Oakland, \$1,500,000; Cleveland, \$1,220,000; Boston, \$1,075,000; San Francisco, \$1,000,000; Buffalo, \$650,000; St. Paul, \$550,000; St. Joseph, \$200,000; Fort Worth, \$175,000; Philadelphia, \$160,000; Hartford, Conn., \$155,000. The cost of equipment and lighting at Buffalo was \$205,000; at Chicago, \$115,500; Boston, \$76,000; Atlanta, \$25,000, and Philadelphia, \$15,000.

**T**HE *Pitcairn News Wing* reports that the cost of a passenger terminal and hangar for the trimotor Ford planes, which it will use in its services to be inaugurated in spring, will be \$150,000. The first of these terminal stations will probably be located at Candler Field, Atlanta, at the terminus of Pitcairn Aviation's recently inaugurated Atlanta-Jacksonville-Miami route.

enclosed waiting room will be provided for passengers in both directions. Passengers delivered by rail overnight from the eastern seaboard will transfer to planes at Columbus, lunching at St. Louis, and arriving at Dodge City, Iowa, in the evening, where they board the Santa Fe train for an overnight ride to Las Vegas, at which point they proceed by plane to Los Angeles and Frisco.

**E. H. HOLMES & CO.**, investment bankers of New York City, announce plans for the construction of a \$10,000,000 airport in the Jackson Heights section of Queens, New York, which is considerably nearer the business center of New York than any other projected airport. A tract of 210 acres has been laid out, of which 120 acres were purchased outright and 90 acres are leased for twenty-one years. The field is to be designed by Black & Bigelow, Inc., New York air transport engineers. This is one of the most ambitious airport projects under consideration. Almost concurrent with the announcement, Colonel Benjamin F. Castle, treasurer of the National Aeronautic Association, publicly criticized the Bennett Field at Barren Island, which is being developed as a municipal airport for the City of New York. Because of the remoteness of this airport, it is predicted that it will never be of much commercial value.

**A**T Anacostia Field, servicing of Wright motors, for a time, required unusual attention. The oil consumption was excessive



Woodward Airport at LeRoy, N. Y., with hangar including school, offices and shop.

**T**HE following municipalities have recently announced their intention to establish airports:

Carlinville, Ill.	Shawnee, Okla.
Downers Grove, Ill.	Arlington, Oreg.
Hutchison, Kans.	Scappoose, Oreg.
Paducah, Ky.	Stroudsburg, Pa.
Marlboro, Mass.	Jackson, Tenn.
Detroit, Mich.	Jellicoe, Tenn.
Wayne, Mich.	Bonham, Tex.
Columbus, Miss.	Jefferson, Tex.
Norfolk, Nebr.	Kerrville, Tex.
Cohoes, N. Y.	Longview, Tex.
Valley City, N. D.	Paris, Tex.
Put-in-Bay, Ohio.	Tulia, Tex.
Eureka Springs, Okla.	Tyler, Tex.

**T**HE Pennsylvania Railroad is erecting an \$850,000 airport along the Pennsylvania tracks at Columbus, Ohio. It will be the first transfer point for the air-rail service. Platforms will be erected along both the eastward and westward tracks and a suitable

and the engines failed to deliver full power. This quickly drew the attention of officials of the Wright company. Their analysis of the situation led to a recommendation that the field be thoroughly oiled. Thereafter no complaints were received. Heavy dust in the air is destructive to motor life, and oil or calcium treatment is a necessity at any field where propeller wash raises any appreciable amount of dust under any conditions. The fact that dust is an inconvenience to spectators is generally appreciated, but its effect on motor maintenance costs has never been as strikingly illustrated as in this instance.

**A** \$10,000 prize has been posted by the Lehigh Portland Cement Company for the most advanced airport design submitted. Harvey Wiley Corbett, noted architect, has been appointed chairman of the committee which will draw up the specifications for the

(Continued on next page)

# Men and Materials



LINDBERGH'S STREAMLINE WIND SHIELDS

Made of rubberized fabric, grommited and laced to a vulcanized skirt on the Goodrich Airplane tire, they pay for their cost in the first few hundred miles of flying.

**M**EN and materials! The *best* of each is required in Aviation and to Aviation Goodrich has given its *best* of each.

Take the Goodrich Streamline Wind Shield for example.

Large bombing planes increased their speed during the World War, lengthened their operating radii, with Streamline Wind Shield manufactured *exclusively* by The B. F. Goodrich Rubber Company.

Lindbergh flew them across the Atlantic on the Spirit of St. Louis.

And now with the advent of larger passenger and commercial planes and of the giant Transatlantics of the future, Goodrich Streamline Wind Shields are expected to play an even more important part in the development of Aviation.

Briefly, the advantages of Goodrich Streamline

Wind Shields are: (1) reduction in *weight*—Streamlines vs. metal discs mean a reduction of from six to eight pounds per wheel in favor of streamlines; (2) reduced *wind resistance*—for example, on two 30 x 5 tires carried at a speed of one hundred miles per hour Goodrich Streamline Wind Shields save approximately *three and one-fourth* horse power; and because of these two advantages, it naturally follows that Goodrich Streamline Wind Shields (3) *increase the speed* of air planes and (4) *lengthen their flying radii*.

To builders of airships and pilots everywhere Goodrich offers the only *complete* line of aviation rubber products and the experience of a whole staff of experienced aeronautical engineers.

THE B. F. GOODRICH RUBBER COMPANY, Akron, Ohio, Established 1870. Pacific Goodrich Rubber Company, Los Angeles, Calif. In Canada: Canadian Goodrich Company, Kitchener, Ont.

## Goodrich Rubber for Airplanes





(Continued from preceding page)  
competition, and he will also serve as foreman of the Jury of Awards. Others participating in the management of the award are Raymond Hood, Chicago architect; Professor William A. Boring, Dean of Architecture at Columbia University; Francis Keally; Parker Morse Hooper, editor of *Architectural Forum*; and C. Stanley Taylor. The full personnel of the board of judges will be announced later.

ON January 1st, there were 9,341 miles of airways equipped for night flying, served by 1,470 electric and acetylene beacons, 259 lighted intermediate fields and 27 radio weather reporting and communicating stations. There are 425 airports listed as municipal, 415 private and commercial, 304 intermediate, 63 Army, 17 Navy, 340 marked auxiliary fields, 942 proposed airports.

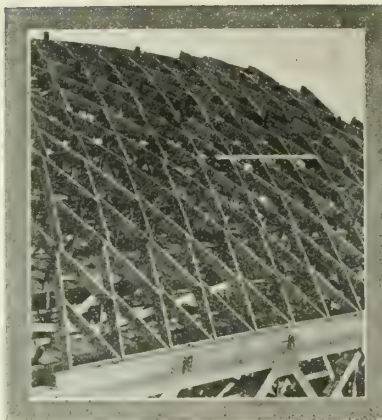
THE Army Air Corps is expending about \$30,000,000 in laying out the new Randolph Field near San Antonio, the land for which was presented to the War Department by that city. The barracks, housing 200 officers and 3,000 enlisted men, will be in the center of the field so that landings can be made in any direction. The entire reservation is to be cleared and sodded. No power line, telephone wires or railroad tracks will be permitted to project above the surface of the ground. The area of the field is 2,400 acres, and 17 farms are being razed in preparation of the ground.

REPRESENTATIVE F. H. LA-GUARDIA of New York has placed a bill before the House, appropriating \$300,000 for grading and preparing an airport on Governors Island. There has been considerable opposition to this project on the part of Army Officials, but LaGuardia, who is a wartime flier, is urging its development because of its proximity to downtown New York. He proposes that it be used merely as an auxiliary landing field rather than as a permanent airport base for the landing of cargo, passengers and mail.

#### Air Transport Services

THE onward march of air mail continues. December 31, 1928, found us with 14,626 miles of air mail routes in operation, as compared with 8,450 miles the year previous and a daily flight of 18,748 miles. The 6,176 mile increase amounts to 73 per cent, and the daily mileage is 12,352. 64 per cent of the mail routes are lighted for night flying. On the twenty-fifth anniversary of the first American railroad, there were but 9,051 miles of tracks in use. Next year, we expect to report still greater growth.

AS soon as the new lighted airways between Salt Lake City and Los Angeles and San Francisco are completed, about April 1, another full day will be clipped from the delivery time of transcontinental air mail between the eastern and western seaboard. Letters mailed in New York at the close of the business day will be delivered in San Francisco and Los Angeles on the



Lamella hangar roof construction.

first delivery service of the second morning following. Under the new system, the present overnight New York-Chicago mail service will become the main transcontinental mail delivery instead of the 12:15 p. m. service as at present. The new service will require a re-scheduling of the several tributary routes of the transcontinental system so that they connect with the new lines.

THE Post Office Department is soon to call for bids for the operation of air mail service between Santiago, Chile, and Cristobal, Canal Zone, following the west coast of South America and connecting with the service crossing the Andes Mountains to Montevideo and Buenos Aires. This mail route will be entirely over foreign territory and will be the longest under the supervision of the Post Office Department. It will serve the entire west coast of South America and will save as much as two weeks in the delivery of mail between certain points.

THE United States air mail service carried 537,113 pounds of mail during December, 1928, as compared with 165,768 during December, 1927 and 39,350 during De-

cember 1926, according to figures recently made public by the Postmaster General.

The increase in December, 1928, over November, 1928, amounted to 112,648 pounds, or 26.5 per cent.

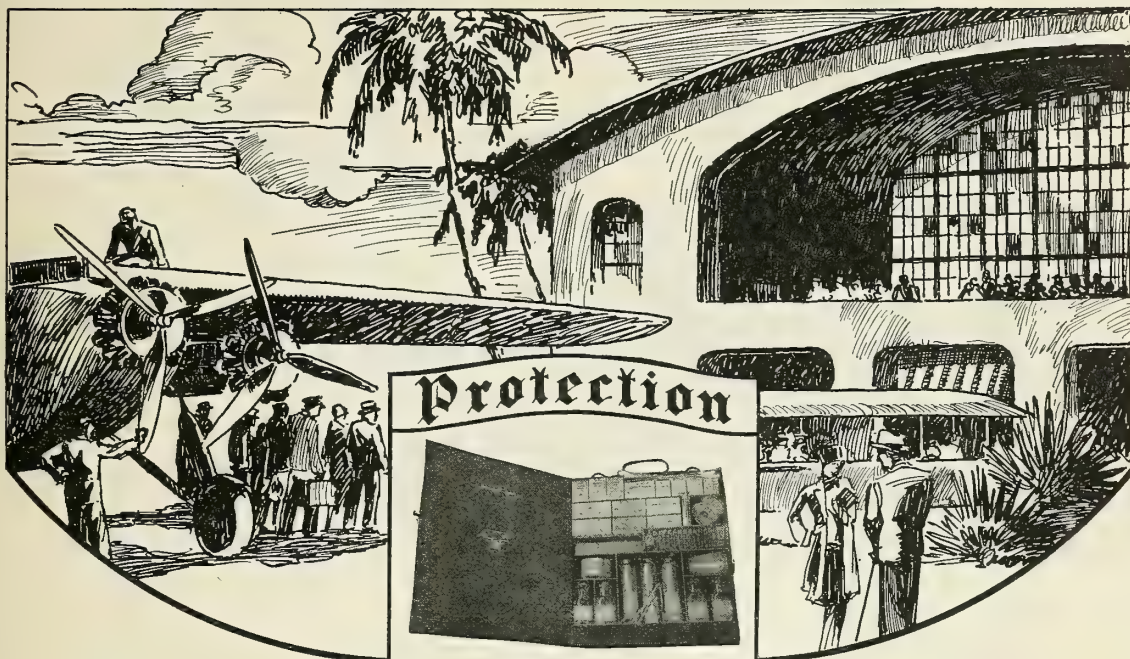
The effect of the 50 per cent reduction becomes more impressively evident as more compilations of records become available. National Air Transport, for example, carried an average of 64,687 pounds of mail per month during the five months preceding the reduction, as compared with 142,687 pounds per month for the five-month period following the reduction, an increase of 120.6 per cent. The total poundage of air mail carried by N.A.T. planes during 1928 was 1,131,961 pounds, or four times that of the preceding year. The monthly average of express matter carried for the American Railway Express Company increased 54.5 per cent during 1928. 11,535 passengers were carried by the N.A.T.'s air mail and express line and its flying service. During two years of its passenger carrying activities, N.A.T. has carried its 12,052 persons without any injury whatsoever. During 1928, National Air Transport planes carried 1,126,067 pounds of mail and 72,380 pounds of express between Chicago, Fort Worth and Dallas, and between Chicago and New York.

IT is expected that the postal service between New York and Mexico City, via Matamoros, is soon to be inaugurated. It is reported that an invitation has been extended to Col. Charles A. Lindbergh, by the Mexican Aviation Company, which now operates the postal and passenger service between the capital and Tampico, to open the service in the near future. Contracts between the Mexican Government and the company have already been signed.

A PASSENGER and express service from Winnipeg to American points is soon to be operated by the International Airways of Seattle. It is to be a tri-weekly service.

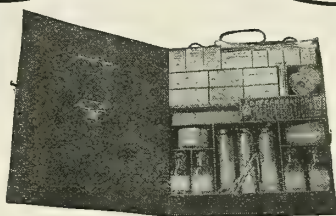
#### AIR MAIL POUNDAGE FOR THE LAST THREE MONTHS IN 1928

ROUTES	MILEAGE	POUNDS 1928		
		October	November	December
Boston-New York .....	192	8,154	6,993	8,344
Chicago-St. Louis .....	278	8,346	6,923	7,185
Chicago-Dallas .....	1,059	30,750	25,769	29,813
Salt Lake-Los Angeles .....	600	45,045	43,066	65,624
Salt Lake-Pasco .....	530	17,235	16,544	20,238
Seattle-Los Angeles .....	1,099	16,479	15,467	20,267
Chicago-Minneapolis .....	503	8,780	8,875	14,003
Cleveland-Pittsburgh .....	123	7,304	12,126	11,962
Cheyenne-Pueblo .....	199	7,383	6,766	8,099
Cleveland-Louisville .....	345	6,456	6,248	6,262
New York-Chicago .....	772	126,040	105,293	126,179
Chicago-San Francisco .....	1,918	124,501	112,187	142,897
New York-Atlanta .....	763	19,125	16,688	20,906
Albany-Cleveland .....	446	7,823	10,225	7,679
Dallas-Galveston .....	318	3,481	3,267	3,846
Dallas-Laredo .....	423	7,053	5,614	6,736
Atlanta-New Orleans .....	483	4,495	4,096	4,352
Chicago-Cincinnati .....	270	5,104	4,910	5,286
Atlanta-Miami .....	622	0	0	5,841
Great Falls-Salt Lake .....	489	4,305	4,165	5,121
Chicago-Bay City .....	522	9,563	8,829	8,694
Chicago-Atlanta .....	785	0	1,076	7,779
Total .....	12,739	467,422	424,465	537,113
Scheduled Daily Mileage		30,544.		



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(Continued from preceding page)

A CANADIAN air mail service between Ottawa, Montreal, St. John and Halifax is soon to be inaugurated. The trans-Canadian mail reaching Ottawa in the early morning hours will leave that city by air for Montreal. Here the mail from Toronto will be taken on to be speeded through the sky to Halifax via St. John, there connecting with transatlantic steamers.



One of the fueling pits at Baer Field, Ft. Wayne, Indiana.

THE United States Weather Bureau now has more than a hundred meteorological stations in operation for the purpose of co-operating with aerial navigation. These stations are linked by a radio communication system which will embrace twenty transmitting points along the principal airways. Pilots are furnished with information regarding barometric pressure, wind direction and velocity.

#### New Devices for Airport Architect and Navigator

A SPECIAL airplane fueling unit, developed by Bowser, is unusually well adapted to the needs of the modern airport. It consists of one or more fueling points on the flying line, enclosed in a metal waterproof box, set flush with the ground level, connected to a pumping unit located in the hangar or oil house. Each pit can serve airplanes within 50 feet in any direction. It is constructed so that, when the covers are closed, there is no ground hazard and airplanes can taxi directly over the pit if necessary.

Within the pit is a hose reel accommodating 50 feet of gasoline hose. The hose is filled with gasoline at all times and is equipped with a self-closing nozzle which permits complete control of delivery at the end of the hose. A meter in the pit records the amount of each individual delivery and also keeps a continuous record of all gasoline passing through the meter. The individual delivery counter may be returned to zero after each operation, making it extremely easy to ascertain at a glance the amount of gasoline delivered to any plane or customer.

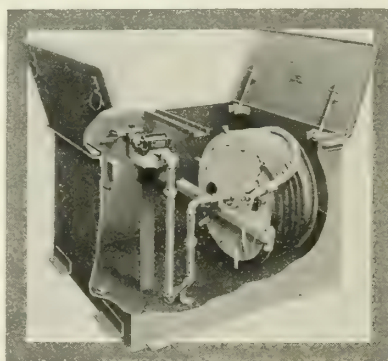
To operate the fueling equipment, the switch in the pit is closed. This starts the pump which operates through a by-pass and relief valve and keeps a constant pressure on the lines until the nozzle is opened at the end of the hose. After the required amount

has been delivered to the airplane, the nozzle is closed and the pump again operates through the bypass and relief valve until the switch is opened, which stops the pumping mechanism.

Included in the pumping equipment in the hangar is a centrifugal filter. The gasoline, in passing through this filter, is whirled at a high rate of speed, which action separates any foreign particles or water from the gaso-

line, measuring clean, dry gasoline to the plane.

Any quantity of clean filtered gasoline, from one to 1,000 gallons or more, can, in this way, be delivered to the plane in a constant, steady stream at a speed of 20 gallons per minute. The speed of delivery is easily controlled or reduced to any desired extent by partly closing the valve at the end of the hose. This does not affect the accuracy of the meter in any way, because it is a positive volumetric displacement type and is consequently accurate under all conditions.



Bowser special airport fueling pit with 50-foot self-reeling hose.

A NEW type of roof construction, known as the "Lamella" roof, evolved by a German engineer shortly after the Tokyo earthquake with a view to resisting such upheavals, is coming into favor for hangar construction because of its low cost, easy erection, and light weight. This type of roof has been used extensively for large buildings, such as schools, auditoriums, garages and post offices. In general, the roof is made up of relatively short timbers, called lamellas, varying in section from two by eight to four by six inches and in length from eight to fourteen feet. These are bolted to-

gether to form a diamond shaped network, bridged and braced by steel tie rods. The city of Santa Monica, Calif., recently issued a request for bids for roofs of this type for several of its proposed hangars, to be 100 by 135 feet in size.

A NEW and simplified set of tables for solving problems in navigation has been published by the Navy Hydrographic Office. It has been evolved by Lieut. Commander J. Y. Dreisenstok and replaces five or six large volumes heretofore used for the purpose. The tables have been used successfully with the fleet in the Gulf of Panama and aboard Navy aircraft.

A FIELD boundary light fixture, having a fully illuminated cone, effective both by night and day, has been brought out by the Pyle-National Company, Chicago. The lights are so arranged that they do not affect the vision of the pilot and at the same time cover a considerable area of the field.

THE Consolidated Instrument Company of America has just announced the development of a portable air speed indicator tester for testing air speed indicators after their installation in a plane. The device comprises a dial registering the air speed and a long rubber tubing which is attached to the instrument to be tested.

A SPECIAL joint legislative committee on aviation of the New York State Legislature proposed the creation of fourteen auxiliary weather bureaus throughout the state for aviation purposes which will work in coöperation with the existing eight Federal weather bureaus already located in the state. The new subsidiary stations are to be located at Elmira, Glens Falls, Hornell, Jamestown, Lake Placid, Little Falls, Malone, Middletown, Olean, Oneonta, Plattsburgh, Poughkeepsie, Ticonderoga and Watertown. The National Broadcasting Company and the General Electric station WGY at Schenectady have agreed to broadcast aircraft weather information so collected, twice daily.

SENATOR HIRAM BINGHAM, president of the National Aeronautic Association, has introduced a bill in the Senate to amend the Air Commerce Act of 1926 by making provision for annual examination and rating of civilian flying schools. In supporting the bill, the Senator pointed to some of the deplorable conditions obtaining and the extraordinary claims made by certain schools. Only reputable schools will, of course, be able to obtain ratings by the Department of Commerce and the measure will be an important protection to the uninitiated, aspiring to participate in the growing field of aviation.

THE huge doors on hangar No. 3 at Oakland Municipal Airport are now electrically operated. It is estimated that the six metal doors on the 120-foot by 200-foot hangar weigh approximately 18 tons. Two 3½ horsepower motors are set at each end of the hangar to handle the doors by means of a cable and chain device.

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# BELLANCA STANDARD CH

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First Non-stop Flight  
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**Made by a Bellanca Standard CH  
Six-seater Cabin Monoplane  
Capt. George M. Haldeman, Pilot**

**Windsor, Ontario, To Havana  
1,404 Miles; Time 12 Hrs. 56 Min.  
Total Weight Carried, 4,369 lbs.**

**Take-off in Snow, 16 Seconds  
Gas, 252 Gallons; Oil 15 Gallons  
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# INTERIORS of CABIN AIRPLANES

(Continued from the February Issue of AERO DIGEST)

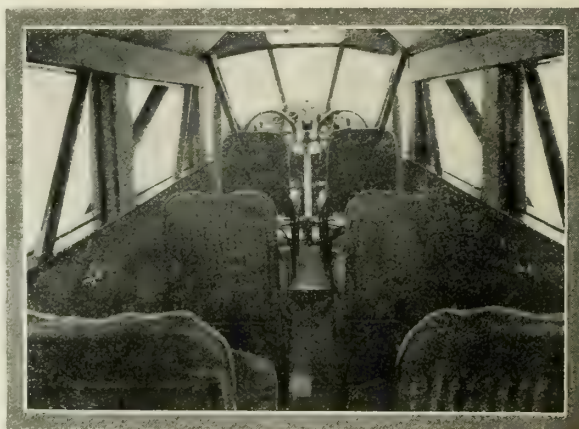
**T**HE unusual diversity of purposes for which airplanes are now used creates a wide range of possibilities for cabin interiors. The interior arrangements of large two- and three-engined transport ships must, obviously, differ greatly from those of small enclosed planes for private or training use. Between such extremes, there are still other types which serve special functions and require special interior treatment. By no means the least among these intermediate types is the class analogous to the private sea yacht. With such private planes the manufacturer is confronted with the special task of furnishing the interior to the owner's taste without violating necessary aircraft practices. In other words, he must adapt the materials suitable for airplane use to the particular requirements at hand. Of course, this condition obtains to a greater or lesser degree in all cabin planes no matter what their size or the purpose, as will be evident from the following description of cabins supplementing those which appeared in the February issue of AERO DIGEST.

## Travel Air 6000

The cabin interior of Travel Air type 6000 is finished with a special Du Pont fabric. Chairs are of wicker and are held firmly in place by a specially designed arrangement. These chairs may, however, be easily removed. The windows, of very practical design, provide excellent visibility for both pilot and passengers. All glass in front of the pilot is non-shatterable. All windows raise and lower by means of nickel plated cranks. A heater is provided to afford uniform temperatures in the cabin despite varying weather conditions.

## Bach Air Transport

The Bach Air Transport embodies many of the most recent refinements in cabin design. The cabin is constructed of plywood, with painted and natural finish. There are eight black stickwillow chairs, each 40 inches high. The cushions and backs of these chairs are upholstered in green leather. The pilots' seats likewise are provided with cushions and back rests. The floor covering is tan linoleum. Two ventilators bring fresh air into the cabin, and heaters in both the cabin and pilot cockpit are provided for winter flying. A cigar lighter is an added convenience for passengers. Wall lights are located between windows.



Interior arrangement of the Travel Air 6000.



Looking forward in the Bach Air Transport.

The lavatory is painted in green. It includes a washstand, toilet seat, towel rack, mirror, etc. Running ice water is provided.

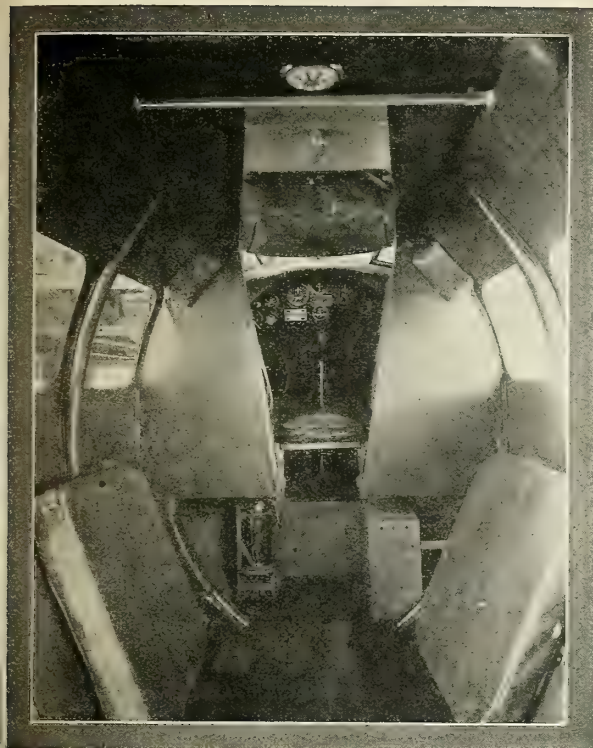
## Keystone Patrician

The main cabin of the 20-passenger Keystone Patrician is 19 feet 6 inches long and 6 feet wide. Ample headroom



Seating arrangement and general fixtures in the 20-passenger Keystone Patrician.





The interior of the Lockheed Vega with seats folded.

is provided so that passengers can move about with ease.

Daylight is admitted through a set of continuous glass panels along the sides. For night flying, dome and wall lights are provided. The chairs are upholstered and roomy. Racks for personal belongings are provided above each set of seats. The walls are insulated to deaden the sound of the engines.

Entrance doors are located at the rear of the cabin on each side. An exit through the top of the cabin is available in case of an emergency.

A set of instruments for the information of passengers is provided. Provision is made for the installation of a radio with a loud speaker, over which programs from ground stations may be received. A sending set may also be installed.

Optional equipment includes a sleeping compartment and kitchenette. The former, in which a standard size berth may be built, has running water and toilet facilities.

The pilot's cockpit is reached through a door at the forward end of the main cabin.

#### Ford Trimotor

The accompanying illustrations show typical special interior arrangements of the all-metal 3-motored Ford transport. In the strictly passenger-carrying jobs single seats are arranged along both sides of the cabin, with an aisle separating them. Wicker chairs are standard; they are upholstered in materials to harmonize with the decorations of the walls and ceiling. At the rear of the cabin a couch is built in. Racks for packages and light baggage are arranged along the side walls. Aft of the cabin space is a wash-room and toilet which is fitted up with facilities similar to those on a pullman car. Cabin heaters, dome lights, sliding glass windows which permit ventilation and allow clear vision, a large entrance door with a convenient step, are some of the features of safety and comfort found in all the Ford transport models.

One of the most unique interior arrangements is that of the Transcontinental Air Transport's experimental plane which is to be operated on the air-rail service soon to be run regularly by T. A. T. This plane is fitted up as a flying office and is used by Col. Lindbergh and John Collings, chief pilot for T. A. T. This ship is provided with a stenographer's desk and a noiseless typewriter, comfortable chairs with adjustable backs, an ice chest, a wash room, toilet and two standard size pullman berths, sliding windows, roller shades, carpeted floor and attractively finished walls.

#### Lockheed Vega

The cabin of the Lockheed Vega accommodates four passengers comfortably. On short flights, however, five may ride in the cabin without discomfort. There are four folding seats which are so arranged that they may be folded to clear more space. Air cushions are used throughout, including the pilot's seat.

The fuselage is of monocoque construction and fully padded on the interior to eliminate vibration and noise. This permits conversation in the cabin without difficulty. The entire cabin and pilot's cockpit, including the sides and ceiling, are finished and trimmed with fabricoid. The floor is covered with a high grade carpet.

A wide door affords access to the cabin, and a door at the front of the cabin opens to the pilot's cockpit. Adequate baggage space is provided.

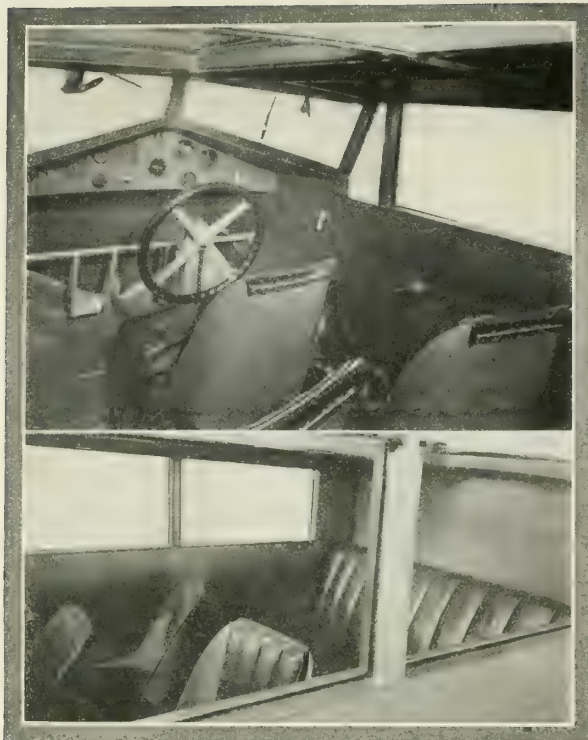
#### Boeing Boat B-1E

The top and sides of the Boeing B-1E flying boat are



The refinements and conveniences of special interiors on Ford Trimotors.





Cabin arrangement of the Boeing Boat

finished with brown fabricoid, and the woodwork is finished in brown mahogany. The floor is of plywood. The pilot's seat and the two passenger seats on either side to the rear are of the bucket type, the frames of which are of dural tubing and are equipped with cushions, covered with real leather, and stuffed with Kapok. The rear seat, which is designed for three passengers is upholstered with the same kind of leather. The two windows on either side of the cabin can be raised and lowered, and when lowered, and the hatches just over these windows raised, doorways are made, which permit of easy access to the cabin. The

windshields can be opened or closed from the inside by means of a worm-driven windshield raiser. Directly in front of the pilot is a metal instrument board containing all the necessary flight instruments.

#### Burnelli Airliner

With its unusually wide fuselage, the Burnelli Airliner embodies several unique features in interior arrangement. The cabin is 11 feet 4 inches wide, 18 feet long and 5 feet 6 inches high. The door, which is aft of the wing, opens into an alcove section of the cabin which contains a completely equipped kitchenette on the starboard side and a lavatory on the port side. Monel metal finished in grained walnut, combined with dural and aluminum, renders this section unusually attractive. Also in this section in a panel at the rear are the radio controls.

The main section of the cabin, which is forward of the alcove, is designed to accommodate 14 passengers. Adaptive upholstered chairs, set in swivels, may be adjusted to any position from upright to recumbent. Being wide and roomy, they assure comfort. Forward in this area is a lounge, which is 6 feet long and 4 feet 6 inches wide, and built over the main fuel tank. This section of the cabin is upholstered in gray-green. The floor is covered with a dark green rug.

The cabin is heated by means of a collector in the rear of the radiators. The windows may be opened for ventilation. The entire cabin (walls, floor and ceiling) is soundproofed by the installation of Balsam Wool beneath the tapestry. There are six dome lights and several base plugs for reading lights. Electric cigar lighters are provided.

#### American Eagle Monoplane

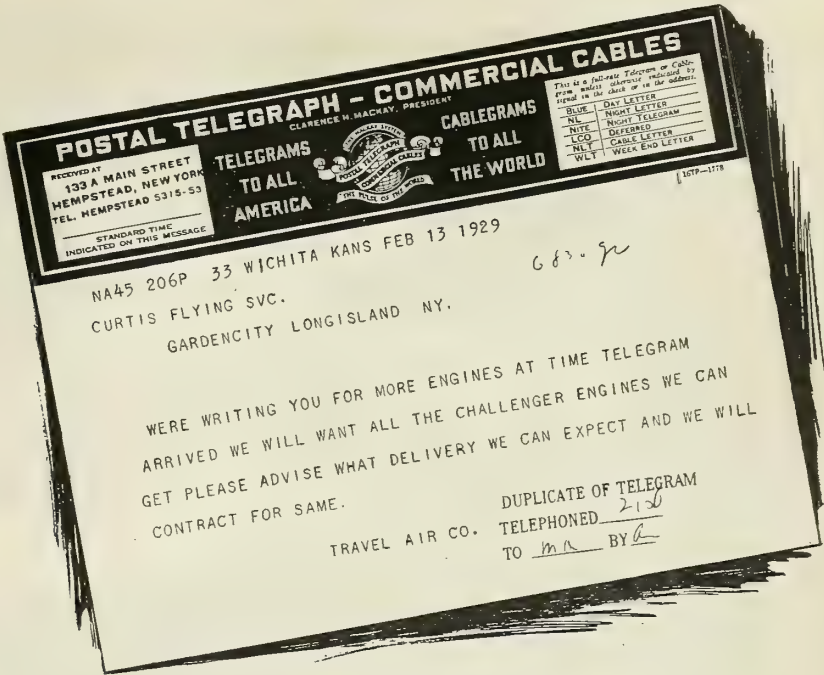
The interior of the American Eagle cabin monoplane is finished in mohair to harmonize with the exterior finish of the plane. Two passengers and a pilot may be accommodated comfortably. To permit freedom of movement within the cabin, there is ample space between the front and rear seats.

Triplex non-shatterable glass windows above, below and both sides provide good visibility for the pilot. They may be adjusted for ventilating.

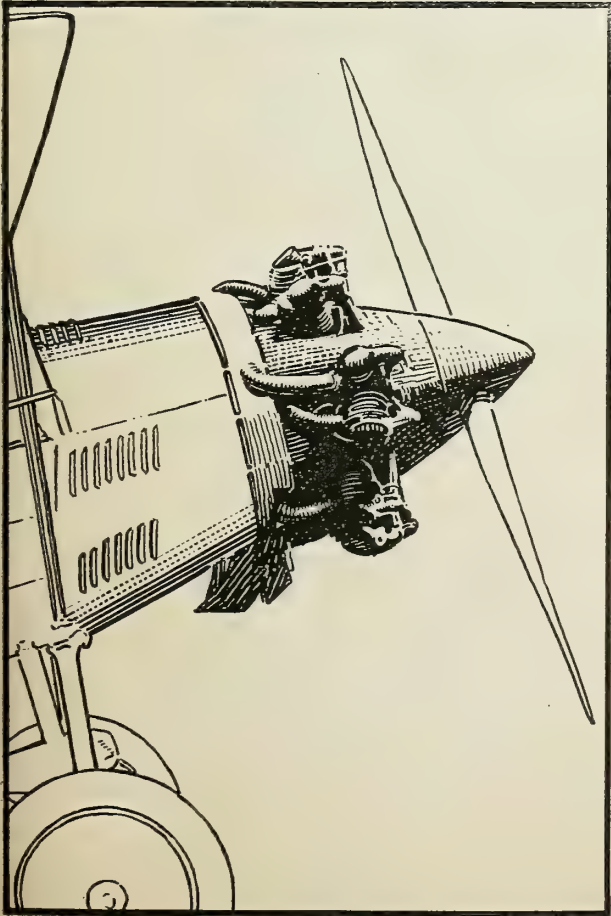
*(To be continued in the April issue of AERO DIGEST)*



One corner of the spacious cabin in the Burnelli 14-passenger airliner.



NOTE the clean lines the  
Challenger Engine gives this  
Travel Air Model



# Curtiss Challenger Engines

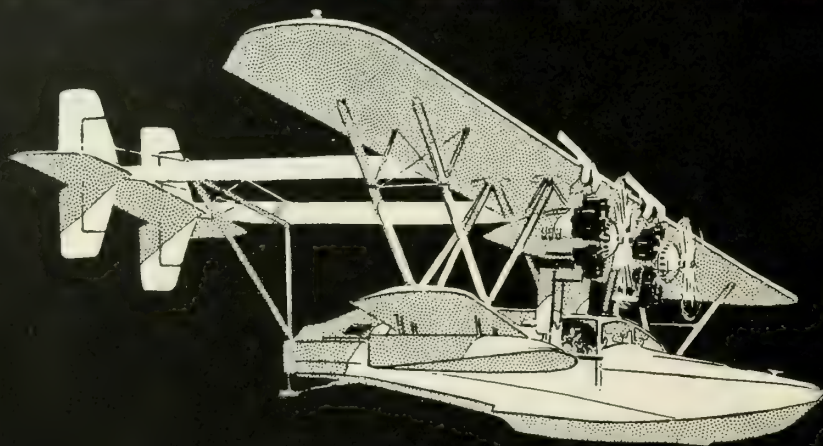


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FLYING SERVICE, Inc.**  
NEW YORK OFFICE—Garden City—LONG ISLAND

Sole Sales Agents for  
Curtiss Aeroplane and Motor Co., Inc.  
Curtiss-Robertson Airplane Mfg. Co.  
Sikorsky Aviation Corporation Ireland Aircraft, Inc.  
"oldest flying organization in the world"



# LINDBERGH AND



# THE SIKORSKY.

## Lindbergh at Cristobal, On Schedule to Minute

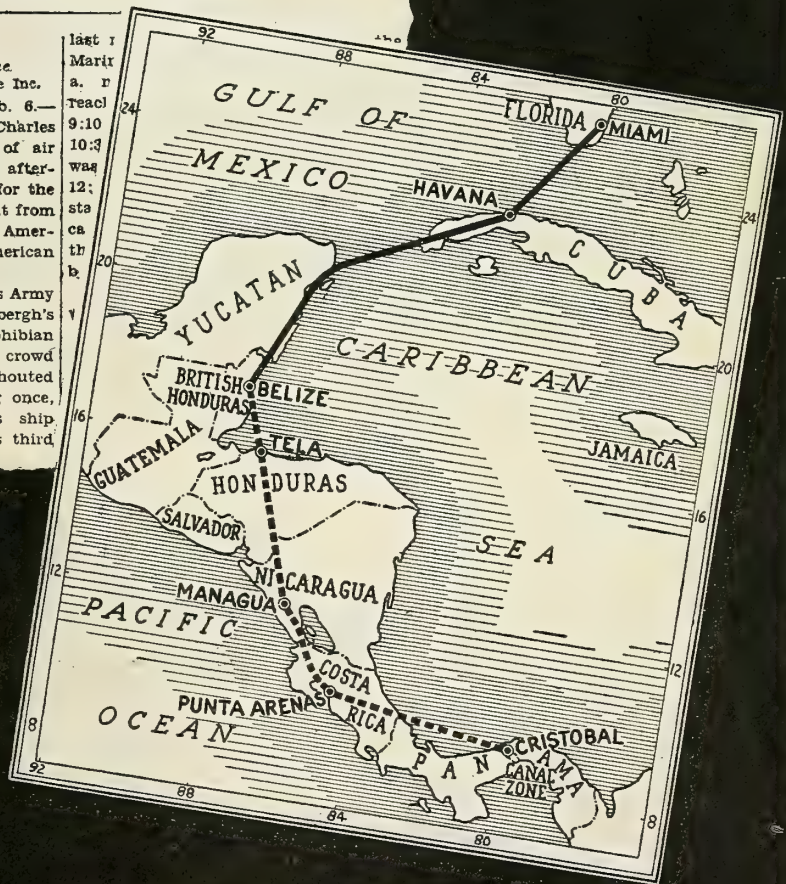
**Eight Army Pursuit Planes Escort Air Mail Pioneer  
While 2,000 Wave Welcome; Flying Time From  
Miami 19 Hours 41 Minutes**

By L. C. Fox

By Cable to the Herald Tribune.  
Copyright, 1929, New York Tribune Inc.

CRISTOBAL, Canal Zone, Feb. 6.—  
On time to the minute, Colonel Charles  
A. Lindbergh landed his load of air  
mail here at 4 o'clock sharp this after-  
noon—the hour set a week ago for the  
completion of his 2,000-mile flight from  
Miami inaugurating the Central Amer-  
ican air service of the Pan-American  
Airways, Inc.

Escorted by eight United States Army  
pursuit planes, Colonel Lindbergh's  
giant twin-motored Sikorsky amphibian  
appeared over France Field as a crowd  
of more than 2,000 persons shouted  
their welcome to him. Circling once,  
the famous flyer brought his ship  
gracefully to the ground for his third  
visit to the Canal Zone.



SOLE SALES AGENTS

**CURTISS FLYING SERVICE, INC.**

**NEW YORK OFFICE, GARDEN CITY, LI.**



# Captain Hawks

TRANSCONTINENTAL RECORD HOLDER  
AND AVIATION ADVISOR to the TEXAS OIL CO.

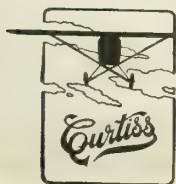
## Chooses a CURTISS ROBIN



(World-Wide Photo)

"My selection of a Curtiss Robin is based on the excellent design and performance of the plane, the experience of the Company producing it, its moderate cost, and the fact that *there will be 25 Curtiss Flying Fields to give me service.*"

*Frank M. Hawks*



### CURTISS FLYING SERVICE, Inc.

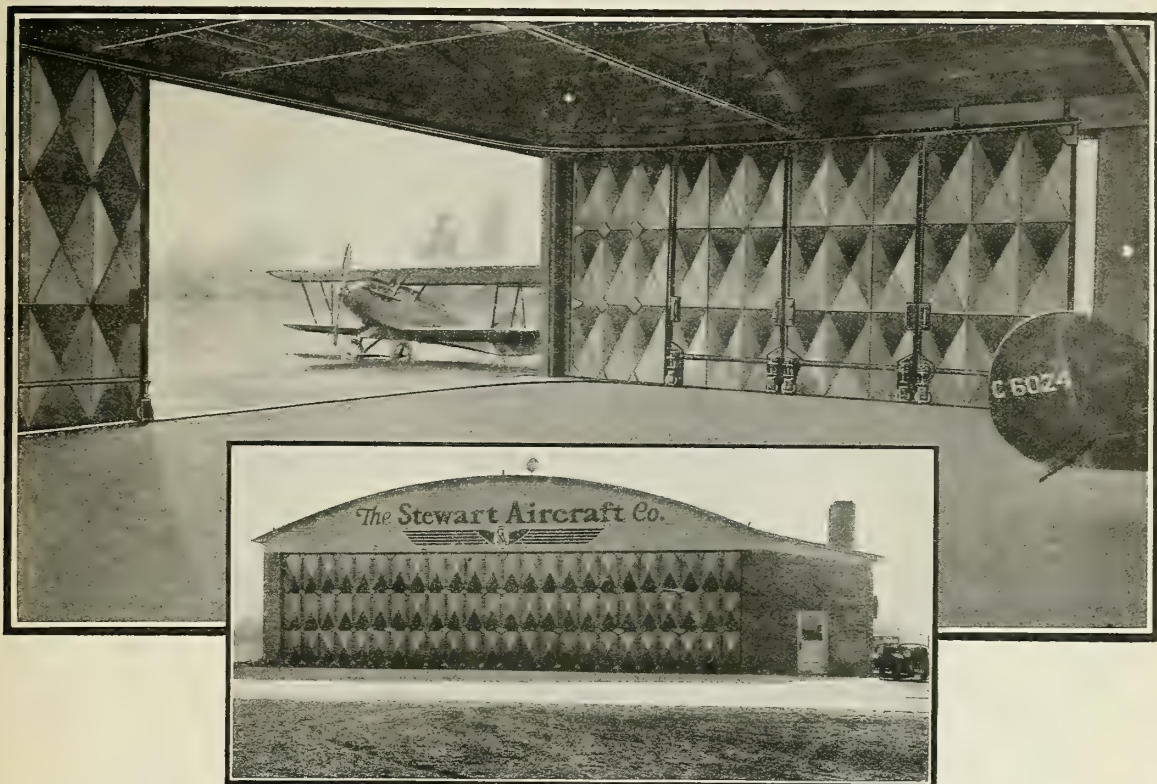
NEW YORK OFFICE—Garden City—LONG ISLAND

SOLE SALES AGENTS FOR

Curtiss Aeroplane and Motor Co., Inc.  
Sikorsky Aviation Corporation

Curtiss-Robertson Airplane Mfg. Co.  
Ireland Aircraft, Inc.

"oldest flying organization in the world"



# There's an **R-W** Way for every doorway

The hangar of the Stewart Aircraft Company at the Cleveland Municipal Airport has a storage capacity of 10 planes. The doorway of the hangar is 56 ft. wide by 13 ft. 9 in. high.

When Richards-Wilcox engineers were called in to solve the doorway problem for this large opening, they installed 8 all-steel doors. They operate on curved floor rails which permit the doors to slide back to either side, allowing a full width unobstructed opening without center posts.

The top of the doors are guided by ball-bearing rollers between two channel irons. The whole weight of the doors—approximately 3 tons—is carried on R-W ball-bearing rollers running on floor rails firmly imbedded in concrete. The ball-bearing rollers give perfect balance to the doors and make one-man operation easy.

The Richards-Wilcox all-metal construction assures a door that will not warp or swell because of rain, snow, and freezing weather.

*Richards-Wilcox all-metal doors and door hardware are not just so much hardware and material. Behind every installation are Richards-Wilcox engineers, who design doorway equipment to function efficiently, economically, and without trouble.*

*If you have a doorway problem an R-W doorway engineer will be glad to talk it over with you. There's an R-W Way.*

## Richards-Wilcox Mfg. Co.

A Hanger for any Door that Slides

New York • • • AURORA, ILLINOIS, U.S.A. • • • Chicago  
 Boston Philadelphia Cleveland Cincinnati Indianapolis St. Louis New Orleans Des Moines  
 Minneapolis Kansas City Los Angeles San Francisco Omaha Seattle Detroit  
 Montreal • RICHARDS-WILCOX CANADIAN CO., LTD., LONDON, ONT. • Winnipeg



# THE SPHERE OF THE AIR COLLEGE

By Oliver L. Parks  
Vice President of Parks Air College

AVIATION is not quite in the plight of Robinson Crusoe, who, having constructed a huge boat to leave his desert retreat, discovered that he had not the man power available to get it down to the water. Yet a parallel of that situation has threatened the aeronautical industry, and it is only by sound, level-headed yet progressive action on the part of the flying schools that the threat can be removed.

It is now the tritest of truisms that aviation is progressing beyond the fondest dreams of man, and it is safe to say, too, that it is progressing along all fronts. Unfortunately, however, it is moving forward more rapidly along the fronts of manufacture and transport than it is along the front of student instruction. Airplanes are being made more rapidly than pilots and mechanics. Transport lines are being put into operation faster than pilots can be put into operation to man the ships.

It is undeniably true that, whereas making of an airplane is a matter of months, the making of a pilot, even under the best conditions, takes a year. Even with that consideration in mind, however, I am still forced to the conclusion that the instruction side of the aeronautical industry has been sadly neglected, so that today the aerial operator instinctively turns to the service schools, to the Army and Navy, for his pilot material. There he is sure he can find pilots who have received a well-rounded education, who may be somewhat short on flying experience, but who have been started properly with sound orthodox instruction in flying practices and a good foundation in the all-important ground subjects.

That is not as it should be. Beyond the fact that to proffer attractive commercial flying positions to officers of the Naval and Army air services has the direct effect of weakening the national defense, it also brings into the commercial field fliers who have not been trained for commercial fly-

ing. Thus it is that the former Army or Navy pilot feels himself laboring under new inhibitions, new "verbodens," when he leaves the speedy, maneuverable service ships and goes to work on the big passenger carriers.

That, then, is the situation we had in mind in the organization of Parks Air College, a school for fliers, with scholarship standards of the highest order but with a systematized curriculum of subjects designed to make the graduate a good commercial flier rather than a military pilot.

Just how successful that plan has become may be shown from the figures in our first nine months of operation. We made our first student flight from Parks Airport, in the St. Louis Metropolitan District just south of East St. Louis, on March 21, last year. In slightly more than nine months remaining of the year, our ships flew almost 8,000 hours. Not a student was injured. Ninety-eight of them obtained licenses as limited commercial pilots. Sev-

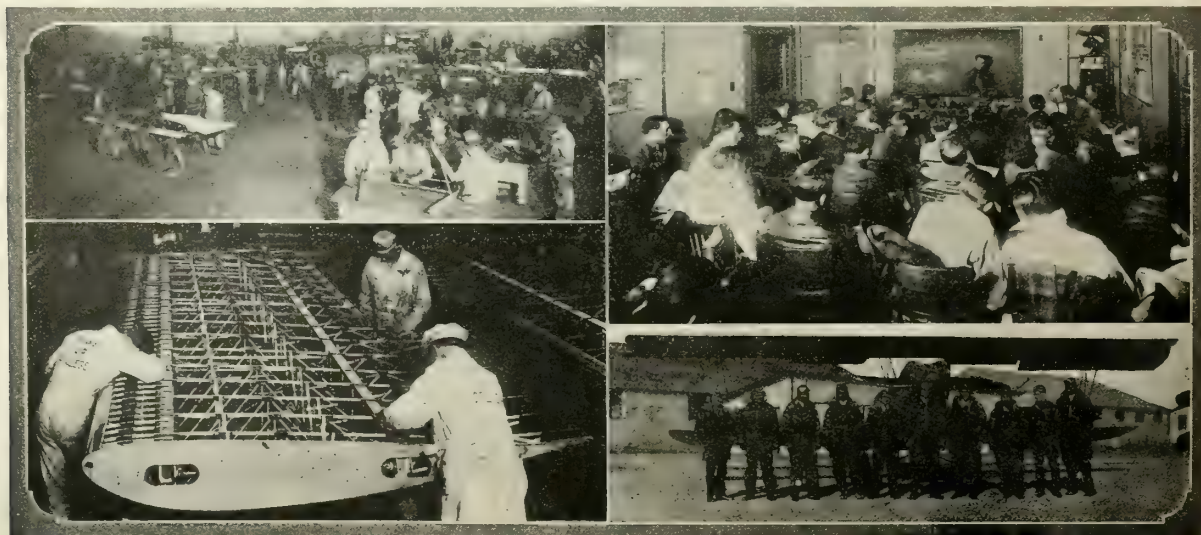
eral who purchased their own ships, and worked hard, had their transport certificates when the year closed. A total of 248 graduated from the primary course.

Here, however, is the significant feature of this new effort in flying instruction. Starting from scratch, we had 431 students on our rolls on January 1st, a total of 177 being in our new school for Airplane and Engine Mechanics and the remainder being in the flying courses. The new year brought a new rush of enrollments so that at this writing the enrollment is in the neighborhood of 600. If there was any doubt as to the demand for regimented, coördinated flying and mechanical instruction, the enrollment records should effectually dispel them.

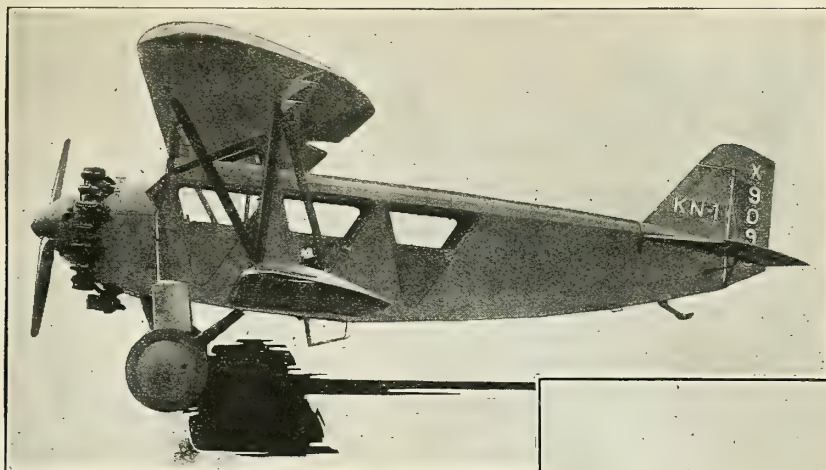
In laying our foundations for the school, we came to the conclusion that above all we must have a complete plant down to the last detail. We realized, too, that we must have exclusive control of our plant, that it must not be located on a municipal field, for instance, and that it must not be operated on a field whose other activities—transport, air mail and the like, might interfere with our own activities.

Accordingly we secured Parks Airport. We equipped it with a beacon and floodlights. We built an administration building, a modern cafeteria, hangars for our ships, dormitories where students may live for \$12 per month, and classrooms with blackboards, lecture room chairs and all the equipment of the university assembly rooms. We supplied the field with 20 new Travel Airs and a Whirlwind Stinson for training in handling of larger ships. We fitted the shop of the mechanical school with the latest woodworking and metal machinery and in the engine lecture room we placed such power plants as the Whirlwind, Liberty, OX-5, Hispano-Suiza, Velie and Camenz.

We made every effort to occupy the true sphere of the air college.



Mechanical and ground school classes at Parks Air College. Lower right: a group of flying instructors.

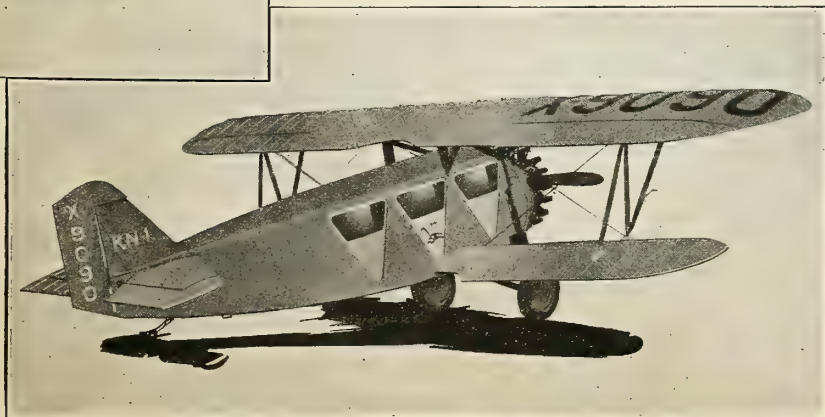


# ADEQUATE ENGINEERING

FROM providing a maximum of comfort and convenience for passengers right down to the last little detail of simplifying maintenance and inspection the KN-1 has had the advantage of an engineering staff of established reputation and long experience.

You will be delighted and surprised by many of its unique features—plywood covered wings—the detachable power plant unit—the hundred and one little details that mark it at once as an outstanding design built by an organization that believes in quality and knows how to produce it.

*The* **KNOLL**  
AIRCRAFT CORPORATION  
WICHITA, KANSAS





# INSURANCE AND AVIATION

THE short history of aviation exhibits the usual phases of all of man's great enterprises.

Thus it received its first impetus from the inventive enthusiasm of certain individuals; its next and greater stimulus from war because of its value as an instrument of destruction; and we now see the opening of its third and constructive phase—a phase which is entitled to support as an economic necessity and an attractive investment.

From a financial standpoint, many sources of income can be adequately appraised and most of the expenditures measured with a fair degree of accuracy. One contingency, however, has yet to be definitely determined in the way of its cost in dollars and cents. That is the unforeseen and unavoidable disaster. If one plane with a pilot and ten passengers should fall upon a building in which are many human beings, it could cause a legal liability to its owners amounting to hundreds of thousands of dollars. Such a contingency, no matter how highly improbable, still is within the realm of possibilities, and some of our conservative investors may demand that the cost of this contingency be charged for and collected for on the income side, and shall be definitely set forth on the other side of the ledger as outgo.

Whatever the cost of disaster shall be, it must be borne by the industry itself and must be definitely stated and charged for in both the income and the outgo. If this is not done, the industry will be merely fooling itself. Some one or even many aviation transportation companies may go for years or even forever without a single disaster, but no one company can be sure that it will be numbered among those so fortunate. Therefore, the cost of disaster in the industry must be divided among all of the planes—the planes which have the accidents as well as those which have not, and the pro rata share of this cost must be a definite item of expense to each plane. In other words, in determining this cost item, the theory of insurance—which is the theory of average—must be adopted.

Consider for a moment a few of the contingencies that confront the insurance company in rating the various hazards involved:

First, take one of the lesser items—the aviation company's financial responsibility for the death of the aviator or other employees in the machine. Of this problem there are several subdivisions:

Certain states have enacted compensation laws definitely fixing the amount of money due the dependents of a workman in case he is killed or injured in his occupation. The laws of some states apply to employees whether they are killed within that state or outside of it, termed "extra territorial." The laws of other states apply only to accidents which occur within the borders of that state—termed "non-extraterritorial."

Then we have the so-called common law states in which there have been no compensation laws enacted and wherein the dependents of an employee, in case of his death, are not legally entitled to any money unless they sue at common law and prove negligence on the part of the employer.

There is a fourth subdivision which probably would apply to aviation transportation companies operated in conjunction with railroads. The employees of such a company would probably come under the present Federal Employers Liability Act or some similar law which Congress in its wisdom may enact.

By Norman R. Moray

*General Manager of the Hartford Accident and Indemnity Company*

Now, what do these subdivisions mean so far as aviation insurance is concerned?

For the purpose of uniformity, let us assume, when referring to a crash, that the employee is killed and that he leaves as dependents a wife, under thirty, and three children, ages approximately six, four and two years.

If an aviation transportation company sends a plane from Boston to Florida and employs the aviator in Massachusetts or Connecticut, wherever the crash, his dependents will be entitled to \$6,550. If employed in New York, they will be entitled to \$29,000; in New Jersey to \$12,000. If in Pennsylvania—a state with no extra-territorial provision in its law—and if the crash is in Pennsylvania, dependents will be entitled to \$8,000. If, however, the crash is in any of the aforementioned states, the dependents of the aviator will be entitled either to the compensation award of that state, or they will have to sue at common law and prove negligence. Which of these two conditions will prevail is dependent upon several contingencies among which is the nature of the contract made with the aviator.

If employed in Virginia, regardless of the place of the crash, the dependents will receive \$3,700. If employed in North or South Carolina and the crash occurs in either of those states, the dependents will be entitled to nothing unless negligence on the part of the employer can be proved.

If employed in Georgia to fly only in Georgia and the crash occurs in Georgia, the dependents will be entitled to \$4,000. If employed to fly outside of Georgia, the Georgia compensation law would not follow him, and the same conditions as respects Pennsylvania would probably prevail. Florida, like the Carolinas, is a Common Law state.

In the event of the larger planes where an aviator and perchance a steward or some other employee is also in the plane, still further complications might prevail. Take the case of a steward employed in New York and an aviator in North Carolina. If they were to crash in either North or South Carolina or Florida, the dependents of the New York steward would be entitled to \$29,000, whereas those of the North Carolina aviator would be entitled to nothing unless negligence was proved.

If a pilot was employed in North Dakota and the steward in South Dakota, wherever the crash, the North Dakota family would receive \$15,000 and the South Dakota family \$3,000. But in the event of employees from a non-extraterritorial state, such as Pennsylvania or Delaware, wherein we assume that the Compensation Law of the state in which they crash would prevail, a crash in North Dakota would entitle the families to \$30,000 but just across an imaginary line into South Dakota they would be entitled to but \$6,000. Whereas a plane following right beside it with two New York employees, regardless of on which side of the State line the crash occurred, their families would be entitled to \$58,000. Therefore, there would be a difference of over \$50,000 between the death of two New York pilots and two South Dakota pilots even though they were killed at the same moment and at the same spot.

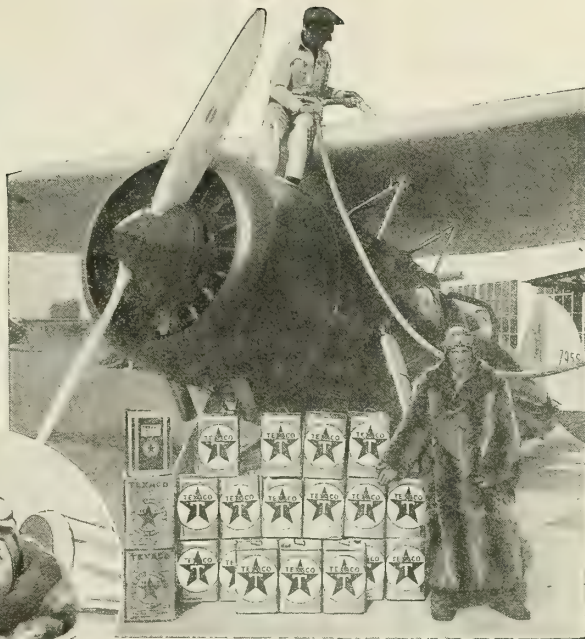
While this analysis could be greatly extended and many more intricacies cited, it would seem that the foregoing is sufficient to explain one of the causes of the delay on the part of insurance companies.

As respects the plane itself or property therein, that liability can be definitely

(Continued on page 214)

Right: Los Angeles, February 4th, 1929. Capt. Frank M. Hawks shortly before the takeoff. TEXACO Aviation Gasoline and TEXACO Airplane Oil were carried in the wing tanks and in five-gallon cans in the cabin.

Below: Capt. Hawks



# COAST to COAST Non-Stop Record SMASHED!

**CAPT. FRANK M. HAWKS SAYS:**

**"My engine functioned perfectly all the way—  
thanks to TEXACO"**

Battling fog, snow and sleet, Hawks raced across the continent in 18 hours and 22 minutes.

He used Texaco Aviation Gasoline and Texaco Airplane Oil in the Lockheed-Vega Air Express to beat the record by 37 minutes.



TEXACO products have that extra quality that makes them able to answer any demands that the weather or your engine may put on them.

THE TEXAS COMPANY—TEXACO PETROLEUM PRODUCTS



# BLAZING AN AERIAL TRAIL OVER THE ANDES

By Captain Henry B. Grow

THE mountainous and jungle-covered Republic of Peru has always been divided by parallel ranges of the Andes that skirt the Western Coast line and by the dense undergrowth that defies construction of transport routes from the Western side of the barrier to the countries adjoining on the East. Three weeks of tedious and primitive travel were necessary to reach Iquitos from Lima prior to the inauguration of the airways service, and, quite naturally, political difficulties arose through lack of governmental centralization and control.

To draw the cities and people closer together and to provide better transport facilities between intermediate points of the State, the Arma de Aeronautica of Peru announced plans in 1926 for the development of an air service designed to link up the segregated centers of the Republic. The writer was appointed to make the survey looking toward establishing the most plausible route for a line extending from San Ramon, a small city cupped in the easterly valley of the Andes, two hundred miles northeast of Lima, to Iquitos on the Amazon, eight hundred miles north through the equatorial jungles.

Therefore, our party started out in the Fall of 1926, with an expedition employing mules, canoes and launches, to explore the region between San Ramon, east of the Andes, and Iquitos, the terminal at the junction of the Amazon and Ucayali Rivers. We returned in the winter to recommend that two land planes and four seaplanes of the convertible type be utilized for the contemplated service.

Six Wright Whirlwind powered ships of the Keystone Pronto type, designed to carry two passengers, a pilot and four hundred pounds of baggage or express, were ordered at once from the Keystone Aircraft Corporation, Bristol, Pa. Superchargers were added for the flights over the mountains at the extreme altitudes, but, subsequently, we found such equipment to be unnecessary inasmuch as the



A Keystone "Pronto" flying over the Ucayali between Masisea and Iquitos.

motors performed satisfactorily even in the rarefied atmosphere.

The land planes arrived at Lima in the summer of 1927. The seaplanes were shipped directly to Iquitos by steamer for service on the northern end of the route from Masisea, where we had established our base on the Ucayali River. Ancon, a seaport city on the West Coast, was selected for the western air base.

There were but two means of getting the land planes over the Andes to San Ramon: either to disassemble the craft and pack them across the ranges of mountains, or to fly them over the eighteen-thousand-foot peaks. We decided upon the latter course. Early in the month of October, Lieutenant Alvarino, assigned by the Inspection General's department, took off in one plane and I took off in the other. We reached the passes in the first range, but the heavy storms prevailing over the mountains at that time of the year forced both of us back to Ancon.

A few days later another attempt was made with the same results. On the third dash we were forced back again, but the fog had closed in on the coast, hiding our base so completely that Lieutenant Alvarino decided to land at the first opportunity. He picked out a small cultivated patch of land halfway up the valley and dropped into the rock-covered field. The ship turned over on the rough ground, putting immediate resumption of the flight out of the question.

In an attempt to return to the base, I set a compass course for the Coast. When I estimated my position to be directly over Ancon, I dropped seven thousand feet through the clouds to check my course and found, with rather discomfoting suddenness, that my original altitude had been about seven thousand and fifteen feet when I started the descent. I brought the ship down at Callao, near Lima, and returned to Ancon a short time later when the fog had lifted a bit. Alvarino's plane was shipped back to the base and put into good shape again within a few hours.

On October 27th, our thrice-defeated expedition set off again to conquer the passes that separated us from San Ramon. The prevailing fogs and clouds

(Continued on page 216)



Unloading the mail at Masisea for transfer to the seaplanes on the river.



“ The only Pilot Training School in America that offers a minimum of 50 hours of instruction—with a minimum of 40 hours dual. ”

Cloyd Clevenger

Flight Training

(An Approximate Three Months' Course)

*Concurrently with Ground School Course modeled after that of the U. S. Army Flying School, including Daily Lectures with Weekly Examinations.*

Total Time in Air—50 hours. Minimum Total Dual Instruction—40 hours. Minimum Dual Before Solo—10 hours. Solo Flying at Completion of Stage I and scattered throughout Stage III.

STAGE I. PRIMARY—Straight Flying; Normal Turns; Power-off Flight; Skidding and Slipping; Stalled Flight; Maximum Climbs; Stalls; Spin Prevention; Steep Banks; Normal Eights; Take-Offs; Landings, Three Point and Hurdle; Solo.

STAGE II. DUAL AEROBATICS—Fish Tail-ing; Sideslips; Review of Stalled Flight and Forced Spins from all positions and maneuvers; Half Rolls; Reversements; Falling Leaf; Loops; Recovery from a Dive.

STAGE III. PRECISION—Cross-Wind Landings; 90 degree Spot Landings; 360 degree Spot Landings; Zig-Zag Spot Landings; Side-Slip Landings; Steep Banked Eights; Two Point Landings; General Review of Turns and Smoothness of Flying.

Cabin Monoplane Flying; Cross County, Night and Instrument Flying; Final Flight Examinations.

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**SCHOOL OF AERONAUTICS**  
INCORPORATED

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Please send complete information to:

Name ..... City ..... State .....

Say you saw it in AERO DIGEST



# THE VISUAL INSPECTION SYSTEM

**S**TANDARDIZATION is the keynote of the new Visual Inspection System installed by the Army Air Corps at the nineteen large Army flying fields in the United States, and in airplane maintenance standardization is an innovation. Every reading person knows, however, of the marvels that have been wrought in the industries through standardizing the manufacture of almost every article, from automobiles to zippers, that is used by the American public. In this connection standardization implies finding out by research the most efficient way to do or make a thing, and then causing the thing to be done or made in exactly that way each time. Where this has been combined with the allotment of special tasks to special workers, who perform those tasks and no others, modern miracles such as the Ford production have followed. The combination of standardization and specialization is covered loosely by the term "production methods."

Before production methods came into being, each worker planned his product and made it through his own efforts. The shoemaker was an artist, and each pair of shoes was his brain-child, the creation of his hand and mind.

In a similar way, the airplane mechanic has been until recently an independent worker. The airplane, that tremendously complicated and delicate structure, with thousands of different kinds of parts, made of various materials, and requiring attention in many places daily, was his to make or mar. His methods were rule-of-thumb, largely learned from contact with others, partly acquired in schools, often devised by himself. His inspections could not be checked in detail without an expenditure of time and effort almost equal to the inspection itself.

In consequence, the pioneer fliers spoke of a good mechanic as a "pearl beyond price." The reports of noteworthy flights are filled with appreciations of the mechanics who, by their ability and zeal, made those flights possible.

Usually, the mechanic has been devoted to his pilot and airplane, and has lavished upon the machine his best efforts. The especially strong bond which existed between the French pilot and his mechanic during the war has been often remarked upon. Frequently, however, the mechanic did not know the best ways in which to perform his complicated duties; sometimes he forgot vital elements, and occasionally he was indifferent.

In aviation, the consequences of failure or neglect are too serious to permit toleration of any but uniform methods of the highest attainable perfection. Effectiveness in war and safety at all times depend upon this.

The visual inspection system prescribes such methods. Routine work required for airplanes has been resolved into its elements, a standard method evolved for the performance of each particular task, definite times appointed for the performance of the work, and provision made for recording the work and the exact mechanical condition of the airplane so that all may see. Some idea of the complexity of this task

may be gained from the fact that sixty-three parts or assemblies must be inspected daily, eight others weekly, and twelve others fortnightly.

The system can best be understood by visualizing it in operation.

To-day, the Army pilot, clad in flying togs and with his parachute dangling from his shoulders, climbs into a trim, speedy looking craft. After buckling his safety belt, he draws from its holder a pad of forms, perforated for ready detachment. The pad is labeled, "Airplane Flight Report." It has a pencil attached to one corner by a string.

On the back of the first form, he finds a complete record of the inspection of the airplane which the mechanic has performed on that day. The engine and all its important parts, the wings, the rudder and elevators, the landing gear, dozens of other vital details,—all are listed, in a special order which facilitates reference. The initial of the mechanic opposite the printed name of each part certifies a satisfactory inspection. If any part was found unsatisfactory, or not inspected, his eye instantly catches the red cross or line which shows the condition. None are found. He puts the pad back in its holder, and secures the catch which holds it while the plane is upside down in a loop or barrel-roll.

As the pilot presses the button, the angry snarl of the electric self-starter responds; an instant later, the roar of the four-hundred horsepower engine breaks forth. A brief interval of warming-up, and the pilot soars away on his mission.

Landing again, he taxis up to the line, and stops the engine. He reaches for the pad of flight report forms. This time he turns to the front of the first form, on which he writes in the appropriate spaces his name, the kind of mission performed, the flying time, and other data for the records. Most important of all, he checks off each important part of the engine and airplane as performing satisfactorily in flight or as needing attention. In this way every flight constitutes a recorded test flight.

This accomplished, the pilot goes about his other duties, which are numerous and varied, for almost every Air Corps officer has much to do aside from flying.

Mechanics roll the ship into its hangar, where it has special space allotted to it. On the wall adjacent to this space is displayed a chart or form of staggering size, ruled with lines having printed headings. This immense sheet of paper, eight feet long and more than three feet high, provides spaces for a complete and detailed record of the maintenance and operation of the airplane during four months. It is known as the Maintenance Inspection Record. There is a separate one for each airplane.

The mechanic especially assigned to the airplane removes the Airplane Flight Report (which covers one day only) from its holder, and copies all its entries onto the Maintenance Inspection Record. This record has spaces corresponding to every space on

the front and back of the Airplane Flight Report. Due to the systematic arrangement, the copying requires less than five minutes. The large Maintenance Inspection Record has other spaces, in which are entered the number of hours he has worked on the airplane during the day and other data. Additional spaces are provided, in which the responsible officers enter their initials to indicate dates of inspection of the airplane and its record. Since all who pass may read, the complete history of the airplane for the period is instantly available to anyone concerned.

The Maintenance Inspection System does not stop at outlining the work to be done. It also provides each mechanic in charge of an airplane with all tools needed for doing it. These are required in considerable variety and number, lack of them is an almost inseparable obstacle to good maintenance. A special stand forms a combined cabinet for the tools, and ladder for working upon the parts of the airplane which are beyond reach. This stand is mounted upon wheels which permit it to be readily moved around the airplane. It is kept in a prescribed location near the Maintenance Inspection Record when in disuse.

Having finished transcribing the record from the Airplane Flight Report, the mechanic takes it to the operations office where clerks extract the data pertaining to flying time and missions performed.

In the past, it has been impossible, except by unrelenting vigilance, to be certain that aviation gasoline was not drained from the airplane tanks and misapplied. Since the tanks commonly hold one hundred gallons or more, twenty-two gallons per hour are usually used in flight, very large amounts could be diverted without detection. The Maintenance Inspection Record, on which entries are made of all fuel and oil placed in the tanks, aids in preventing such losses. At the end of each month, the total amount of gasoline issued to the airplane is determined; this is divided by the flying hours, and the results must agree with the known hourly consumption for the type of engine. The total gasoline shown as received by all airplanes at the stations must agree with the total issued from the main storage tanks, which are readily safeguarded.

All this sounds like a great deal of record-keeping. But when it is considered in relation to the investment in the pilot and airplane, and the cost of operation, it is small. The cost of a modern airplane ranges from ten to thirty-five thousand dollars. An experienced military pilot frequently represents an investment in training of more than a hundred thousand dollars. In addition to humanitarian considerations, it is found that the safeguarding of this investment through efficient maintenance and inspection and accurate records would far more than repay much extra effort. In fact, the mechanic actually works more efficiently, by reason of being guided into systematic habits of work.

## Airplanes in Service

Approved, March 25, 1927. Engine Type A. C. No. .... Mig. No. .... Change to..... Assistant ..... Assistant ..... Assistant ..... Station .....

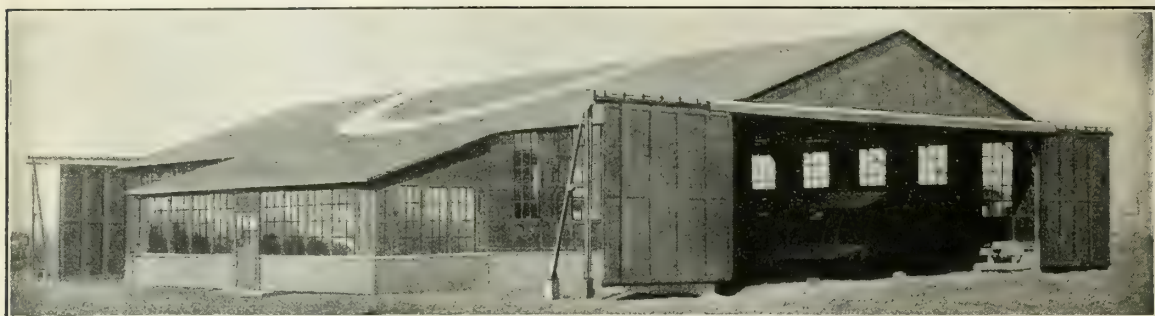
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# Quick Delivery and Erection of Standardized Fireproof Hangars



Truscon Steel Hangar—quickly erected at economical cost.

Built with clear floor space free of columns for the easy handling of airplanes and with large steel doors with or without glass and opening the full width, Truscon Hangars amply meet every aeronautical requirement. They are fireproof throughout with Steeldeck roofs, insulated and waterproofed, and with any amount of steel windows for daylighting. Repair shop may be in an adjoining lean-to or in a separate building. Truscon Hangars are designed to fit your needs. Literature and suggestions on request.



Truscon Steel Hangar Doors—durable and easily operated.

## STEEL DOORS of Advanced Design for Every Type of Hangar

Truscon Steel Hangar Doors are substantially built of quality workmanship. When open they occupy minimum space so as not to impede the movement of airplanes. Truscon Hangar Doors operate easily, sliding on straight or curved tracks. They are furnished in any specified size.

WRITE FOR QUOTATIONS

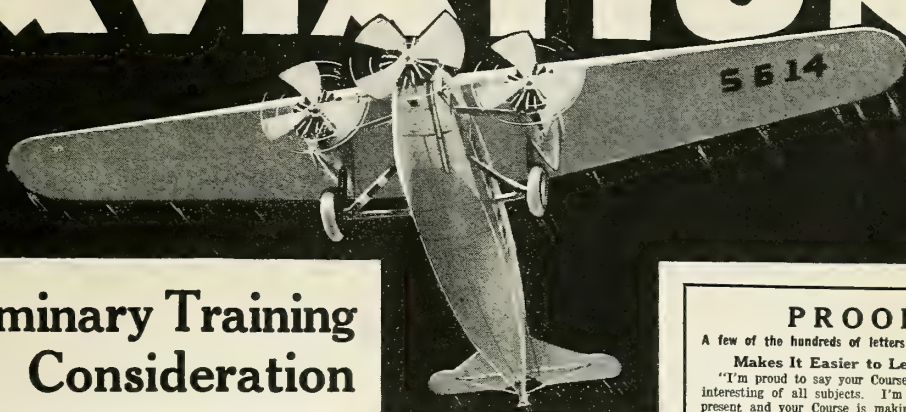
TRUSCON STEEL COMPANY, YOUNGSTOWN, O.

*Aeronautical Division*

*Warehouses and Offices in all Principal Cities*

# TRUSCON HANGARS AND STEEL DOORS

# How You Can Get Into AVIATION



## Preliminary Training First Consideration

You, who can see the money-making opportunities in Aviation and are wondering how you can get into it, must understand one important fact before you start. No one except a TRAINED MAN can take full advantage of the opportunities. The day is past when any hanger-on at an airport gets to be a pilot. The era of *Commercial Aviation* has arrived, with 1929 destined to see the greatest development this industry has ever known. The call is for men—*trained men*—Pilots, Motor Experts, Airplane Designers, Airplane Assemblers, Airplane Mechanics, Metal Workers, Airport Managers, Salesmen. TRAINING is the key that unlocks the door leading to these big pay jobs.

### Do You Want to Be a Pilot?

You must get your *preliminary* training first. You should know all the parts of a plane; the different instruments; principles and theory of flight; technical expressions and slang terms; handling of controls. To get your Pilot's License you must have a theoretical as well as practical knowledge of meteorology, aviation, air traffic rules, etc.

### Do You Want a BIG PAY Ground Job?

For every plane in the air, there are 40 jobs open on the ground. Some of the biggest men in Aviation started with ground jobs. They rose fast because they mastered first the FUNDAMENTALS of Aviation. You must know airplane engine mechanics, plane structure, rigging, control systems, etc. Many ground jobs pay bigger money than Pilots earn. But you *must* have the FACTS. You *must* know these subjects thoroughly if you want to hold a good job at big pay.

But you say, "How can I learn these things? What books shall I study? Where will I get them? How do I get started in Aviation?"



### What We Teach You

Airplane Motors  
Aircraft Instruments  
Airplane Design  
Airplane Construction  
Rigging  
Principles and Science of Flight  
How to Handle Ship in Air and on Ground  
Air Navigation  
Meteorology  
Air Traffic Rules  
and 100 other fascinating subjects.

National Aviation Training has anticipated these questions and answered them in their Special Home Study Course in Aeronautics. We have taken all the up-to-date, authentic information on Aeronautics and have sifted out the "meat" of each subject. This has been arranged systematically into a series of simple, easily understood lessons that take you from the very beginning and lead you every step of the way. By spending a little of your spare time you can quickly secure, at home, the training necessary to get a start in Aviation.

Our large staff of experienced Aviation Pilots, Airplane Manufacturers and Instructors will teach you the inside facts and give you the advice which will bring you success.

### Quick and Easy to Learn By This Proven, Home Study Method

There is nothing hard about it. You will find the lessons almost as fascinating reading as actual flying. Almost before you realize it the Course will be finished and you will be ready to take the next step into Aviation and a job. You don't have to leave home, or give up what you are doing now. There are no big tuition fees, nor traveling and other heavy expenses away from home. You get this training right where you are now, in your spare time.

Age, little education or lack of training is no barrier. Start just as you are, for under the terms of our Money-Back Bond we guarantee that you will be satisfied.

Get your preliminary, basic training *at once*. Whether you plan to fly or to cash in on one of the 40 Big Pay Jobs on the ground, you should have this training first.

**\$40 to \$200 a Week**

That's what the *trained* Aviation Expert is earning! And he is never out of a job the year around.

## PROOF!

A few of the hundreds of letters from our students:

### Makes It Easier to Learn Flying

"I'm proud to say your Course is one of the most interesting of all subjects. I'm a flying student at present and your Course is making it much easier."

—EVAN TAYLOR.

### Covers Aviation Thoroughly

"I intend joining the Naval Reserve Aviation division and your Course will prove worth many times what I paid for it. It is in simple English and can be understood by anyone. It presents problems in a way that makes it no task to master them. And it covers the broad field of aviation thoroughly."

—CHANDLER SMITH.

### A Shortcut to Pilot

"The things you teach in your Course are the first things a student is required to learn in a Flying School. So by taking your Course I will be several steps further ahead toward being a Pilot, without having to learn it in school."

—TOM JONES.

### Helped Construct "Ship"

"Your Course has helped me very much in constructing my ship which is completed now."

—R. J. ERLER.

### Could Fly With First Lesson After Taking Course

"I have my own ship now and have been flying three months. Flew an Eaglerock at Wichita Falls at the Browning Air Port and I could fly it in the air fine the first lesson I took. Lots of power to you fellows and depend on a good word from me."

—GEO. R. POLLARD.

Everything is ready but the men. Will you answer the call to this big pay industry? Get ready now for the job National Aviation Training will help you get.

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Send the coupon for our free book, "Aviation and Its Opportunities for You." Also details of our Free Scholarship Certificate for flying lesson, free Employment Service, and other big features of the N. A. T. Course. If you are seriously considering a future in Aviation, you should by all means read this booklet. We offer you a free copy now without obligation. Mail the coupon for yours today.

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# TECHNICAL

## BUHL STANDARD CA-6 AIRSEDAN

**A**T the New York Aviation Show last month the new Buhl Standard Airsedan was exhibited to the public for the first time. This is the first commercial plane flown and tested with the new series Wright Whirlwind J-6 engine. The ship was flown from Detroit to Curtiss Field, Long Island; it was disassembled there and transported to the aviation show where it attracted wide attention. The ship was purchased at the show by the Cherry Red Air Lines of Saskatchewan, Canada, to be used for carrying miners and prospectors to the new Rotten Stone Lake area, etc. In winter wheels or skis will be fitted and in summer floats will be used. Special floats are now

being designed and constructed by the Edo Company for this purpose. The model CA-6 is particularly adaptable for transport lines carrying passengers and mail.

Visibility from this plane is one of its important features. Uninterrupted view is possible of the country directly ahead and down at the sides, and vision is particularly good in taxiing as the engine in the nose does not obstruct the view ahead. Windows are made of Indestructo glass, the front panels being fixed and those at the sides capable of sliding so that while flying in sleet or bad weather, the pilot may look directly out in the open.

The cabin is unusually quiet, equipped with

heaters and a complete set of instruments. An adjustable periscope is located above the pilots, enabling them to see back over the top of the cabin. The device is retractable so it offers no resistance when not in use. Long exhaust mufflers reduce the engine noise to a minimum.

Dual controls are fitted, the right hand control being removable. Besides the two pilots' seats, which are adjustable fore and aft, comfortable seats for four additional passengers are provided. The two center seats have hinged backs to enable easy access to the pilots' seats. The rear seat which accommodates two persons, is built into the rear of the cabin space; it is deeply upholstered in automobile style. All upholstery as well as the safety belt covering is with blue mohair, and auto-type spring seats are used throughout. Two flush dome lights are set in the ceiling, roller shades are provided on all side windows and match holders and ash receivers are fitted to the side walls. Window trim is of natural finish walnut.

Bendix wheel brakes are operated from heel pedals. Landing wheels including the tail wheel are of the oleo type. The stabilizer is adjustable during flight by means of a lever between the two pilots' seats.

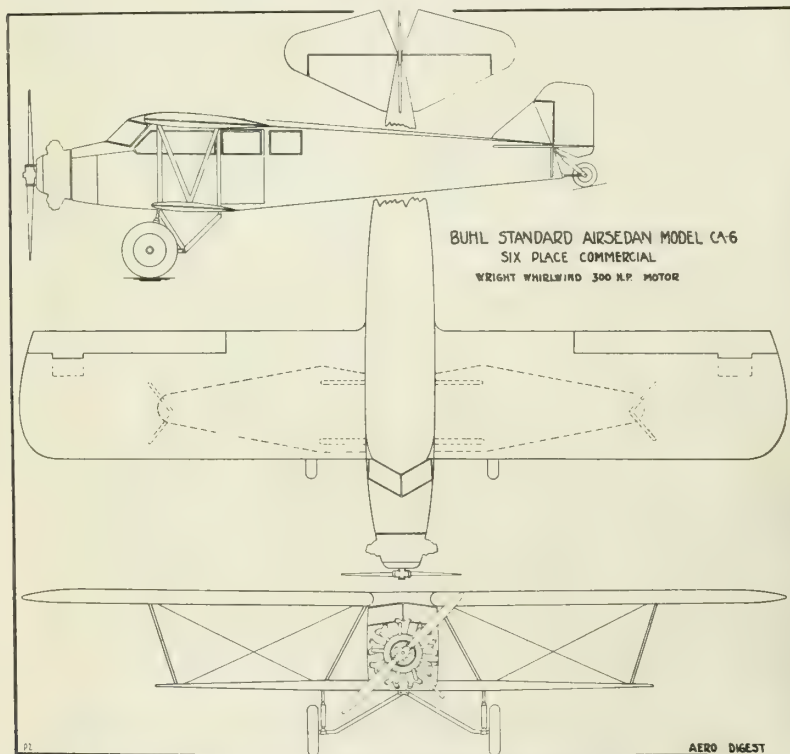
All fuel is contained outside the fuselage in two wing tanks of 50 gallons' capacity each. Gasoline flows by gravity to the engine through a 3-way valve set in the instrument board. A simple sight gauge below each tank shows accurately the contents so no reserve tank is required.

A large baggage compartment is located aft of the cabin. It is accessible from the cabin as well as from the outside.

The Eclipse hand inertia starter is used. Hartshorn streamline wires are employed in the rigging. A Pyrene fire extinguisher is held in a bracket on the floor against the rear seat.

### Specifications

Wing span, upper.....	40 feet
Wing span, lower.....	26 feet
Gap.....	55 inches
Chord, upper wing.....	81 inches
Chord, lower wing (average)....	46 inches
Wing area.....	305 square feet
Length overall.....	29 feet 8 inches
Wheel tread.....	9 feet 6 inches
Height.....	8 feet 7 inches
Weight empty (actual).....	2,450 pounds
Fuel capacity.....	100 gallons
Oil capacity.....	8 gallons
Engine, Wright J-6.....	300 h. p.
High speed.....	145 miles per hour
Landing speed.....	45 miles per hour
Cruising speed.....	115 miles per hour



Buhl Airsedan, model CA-6, powered with a Wright J-6 Whirlwind engine.

BUHL BLDG.



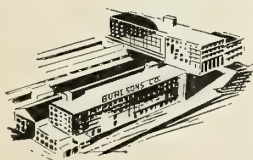
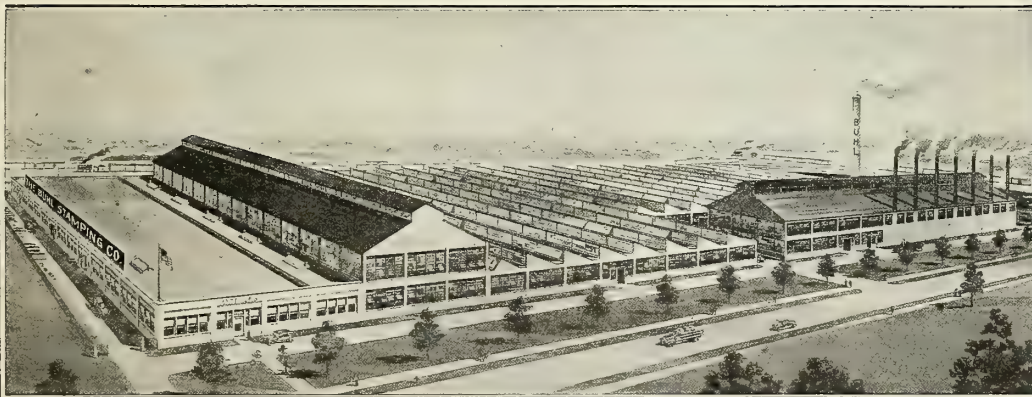
DETROIT

# Announcement -

**T**HE Buhl Stamping Company, for more than 40 years producers of fine metal stampings, announce a division specifically created to serve the needs of the aircraft industry. In addition to its wealth of experience and unsurpassed physical and financial resources, this company is peculiarly fortunate in its close association with the allied Buhl aeronautical interests. Such a combination of facilities and talent make it truly a source of supply as dependable as the products which have gained it world-wide recognition.



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THE BUHL NAME has been identified with progressive industry since 1833. Three generations, and now a fourth, have created, developed and managed enterprise after enterprise—ever pioneering new fields, ever achieving new success.

**BUHL STAMPING  
COMPANY**

*DETROIT, MICHIGAN*



# BARLING MONOPLANE

**D**ESIGNED by Walter H. Barling, one of the foremost of aeronautic engineers, the new Barling NB3, built in the Nicholas-Beazley Airplane Co., Inc., factories at Marshall, Missouri, is a three-place, open cockpit, metal structured, low wing, cantilever monoplane powered with a Le Blond 60 h.p. radial air-cooled motor. It is primarily intended for training, passenger and lesser transport operations.

The salient features differentiating the Barling design from conventional types obvious to outward appearances are: the thick, high-lift, efficient Barling No. 90-A airfoil section adopted in the wing; the dihedral wing-tip; the streamlining, the light structure, the forward position of the landing gear and the method of attaching the wing to the fuselage.

Mr. Barling has devoted his attention for the past thirteen years to developing the shell-type structure, and to incorporating enough strength in it so as to eliminate the total dependence of the main structure to wires, turnbuckles, and other lesser parts. The box-spar wing structure is an answer to the attempts of designers during the world war to attain a military plane which would not be vulnerable at so many points in the structure.

The fabric covered corrugated duralumin wing is made of one principal box-spar on to which duralumin plates and channel strips are riveted for nose and trailing edge ribs to complete the airfoil section. In the center of the spar eight sturdy duralumin plates, placed in pairs, complete the four points of attachment to the fuselage. Nickel steel bolts are used at the attachment points.

The entire wing may be removed from, or attached to, the fuselage in less than twenty minutes, simply, and with no problems of alignment. The simple, split axle landing gear is made of oil tempered chrome molybdenum steel streamline tubing, with shock cord to care for landing stress. The entire gear is placed well forward almost directly under the nose, which with its pronounced slant forward, precludes the possibility of nosing over. Wheels are 24 by 3 and streamlined with aluminum discs. The tread width is 4 feet 9 inches. At the top of the tubes of the landing gear, fitting tubes are attached which are inserted into welded fitting tubes on the lower longerons

and thus the landing gear may be held in place by stout pins running through the fitting. The gear is quickly and simply attached or detached.

The wing is a striking departure from accepted designs and particularly do the blunt, non-tapered and up-tilted tips convey this impression. The tip panels measuring 5 feet 6 inches are detachable from the main wing, which measures 20 feet 6 inches, but they are of the same type of construction with the single exception that ailerons are attached in place of trailing edge ribs. The dihedral angle of five degrees is obtained by the thrust tube attachments at the point of contact of the main wing and tips which tilt the outer panels to give the dihedral. Great stability is obtained in level flight and ordinary banks are executed with exceptional ease while recovery from every banking angle is remarkably quick and almost automatic. "Hands off" flying in adverse wind currents in a number of instances has proved this particular adaptation of the dihedral to possess self-righting qualities to a remarkable extent.

The special airfoil section, Barling 90-A, has demonstrated excellent lifting ability. Both the camber of  $11\frac{1}{4}$  inches and the chord of 5 feet 2 inches are constant over the entire span of 32 feet 6 inches.

The fuselage is nicely streamlined from propeller spinner cap to rudder. Throughout the entire length of 21 feet 6 inches, the proportions are carried out by aluminum framed fairings. The upper part of the landing gear is shielded by an aluminum framed balsa cover, the streamlining back of the cockpits and the fairing on the under side of the fuselage help to complete the attractive contour.

Even the gas tank on top of the fuselage immediately back of the firewall, performs its function of streamlining by the curved profile. The gas tank is readily accessible and may be dismantled by unscrewing the clamps on two retaining bands. The streamline head rests for both cockpits and the fairing on the under side are inherent parts of the structure.

Tail surfaces are conventional with the single exception of the distribution of area. Both rudder and elevators are balanced. Both stabilizer and fin are adjustable on the ground only; since all weight of payload is carried over the center of gravity

there is no need for the stabilizer to be adjusted in flight.

The rudder is fastened with tubing hinge joints at three points; one at the fin and two on the fuselage. The elevator is hinged to the stabilizer.

The spring tail-skid is attached to the tail post of the fuselage.

Ailerons are differentially operated by control tubes attached to the ailerons. The push and pull type control tubes are shielded within the wing being connected with a lever device within the wings which in turn is attached to a double tram cable operating directly through the wing to both lever devices. The control stick "tree" attaches to the cable. Ailerons are hinged at three points to the main metal spar of the wing. The total aileron area is 19 square feet.

Fabric covering is used on all surfaces. The particular construction of the wing allows an unusually good airfoil section with fabric covering, the leading edge being rounded by duralumin sheeting.

Stock models come in optional color combinations of orange and black, or blue and silver. Streamline wheel discs are trimmed in both colors of one combination.

The engine mounting, not being interchangeable, is welded securely to the frame of the fuselage. Cowling is made up of numbered pieces that are easily clamped and securely held into place by button-type fasteners. The cowling is well executed for perfect streamlining, following through between the cylinders of the motor to the spinner of the propeller.

Pilot and passenger chairs are made of upholstered duralumin with webbing seats. Floor boards are of plywood.

Both pilot and passengers are comfortably inclosed within the protection of the streamline cowlings.

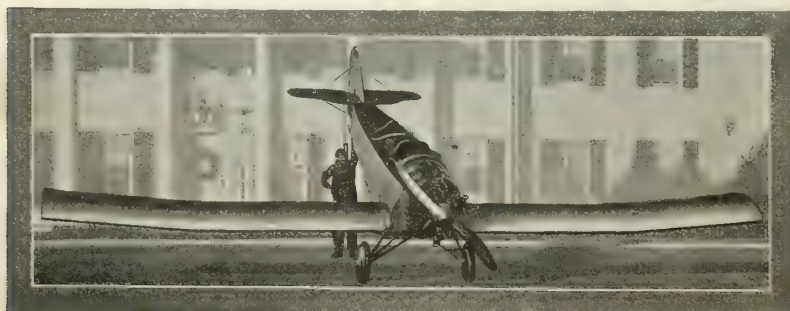
Specifications and performance figures as issued by the manufacturer are as follows:

## Specifications

Span .....	32 feet 6 inches
Chord .....	5 feet 2 inches
Wing area .....	159½ square feet
Area of tail surfaces .....	25 square feet
Dihedral .....	5 degrees
Length .....	21 feet 6 inches
Height .....	6 feet 10 inches
Weight (empty) .....	676½ pounds
Wing loading (full load) .....	8.3 pounds square foot
Gas capacity .....	25 gallons
Oil capacity .....	3 gallons 1 pint

## Performance

Take-off time .....	3 seconds
Take-off run .....	60 feet
Climb to 1200 feet .....	one minute
Climb to 8000 feet .....	eight minutes
Top speed .....	110 miles per hour
Cruising speed .....	95 miles per hour
Landing speed .....	32 miles per hour
Run to stop at landing .....	38 feet
Service ceiling .....	18,000 feet
Ultimate ceiling .....	21,000 feet
Gas consumption at cruising speed .....	3.7 gallons per hour
Oil consumption .....	½ pint per hour
Cruising range .....	7 hours or 700 miles



The Barling NB-3 low wing training monoplane

# *The New-Day Plane is Ready!*

The Barling NB3 has taken its place in the sky!

This announcement, so eagerly awaited by the aeronautical world, culminates fourteen years of intensive study and exhaustive experiment by Walter H. Barling, internationally known engineer.

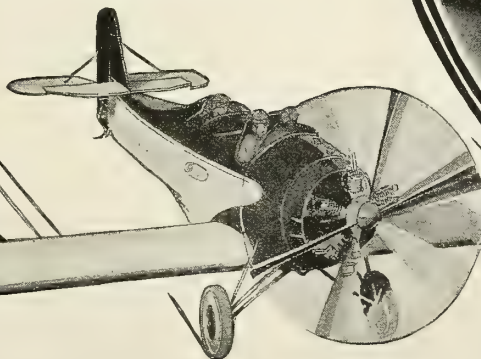
Competent aviators pronounce the Barling NB3 years in advance of any other aircraft now marketed. It is truly a New-Day Plane!

The structure of the Barling NB3 is the safest and least subject to failure of any airplane now made. Fundamentally sound dynamic principles, the advanced shell-type box-spar all-metal wing, utter simplicity—these are but a few of the ingenious features engineered into this monoplane.

The Barling NB3 will make its official debut at the Detroit Show. In the meantime, distributor contracts are still available in several sections of the United States.

Watch for announcement of specifications and performance records next month.

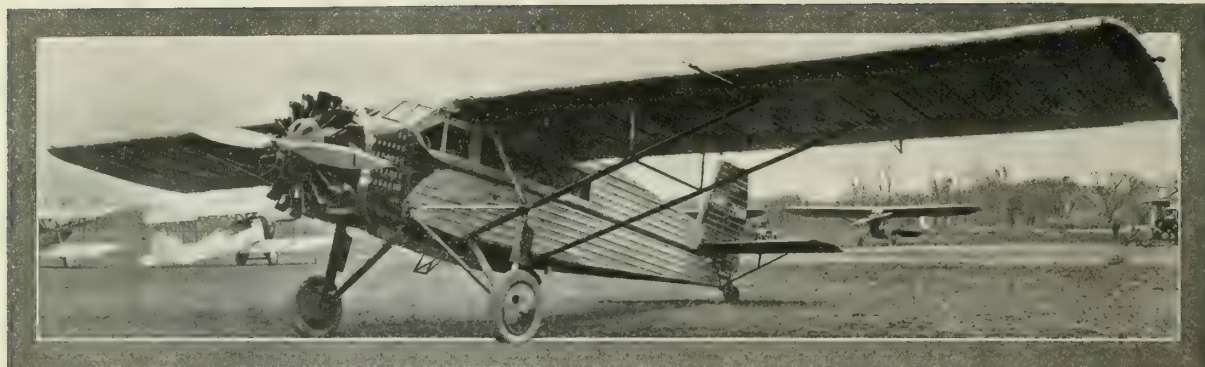
NICHOLAS-BEAZLEY AIRPLANE CO., INC.  
Manufacturing Division  
MARSHALL, MISSOURI



# BARLING NB3

*Mon(AB)plane*





## THE FLAMINGO G-2-W

**T**HE Flamingo, built by the Metal Aircraft Corp., of Cincinnati, Ohio, is a high-wing, all-metal monoplane, powered with a Pratt & Whitney "Wasp" or "Hornet" engine. With the Pratt & Whitney "Wasp" it cruises at 115 miles per hour and has a top speed of 135 miles per hour; with the "Hornet" its cruising and high speeds are 5 miles an hour greater. The Wright "Cyclone" engine may also be used which gives the plane a performance comparable to that of the "Hornet."

The wing is of the semi-thick, high-lift type, having lift braces attached at 58 per cent of the span. It is constructed entirely of duraluminum, the spars being of I section, the flanges built of extruded dural angles with a dural web set between them. There are 36 ribs in the whole wing, made of flat dural sheet, all exactly alike, with holes punched and flanged to give lightness and rigidity. There is drag bracing in the inner bay, the skin taking the drag load in the outer bay. The drag struts are steel tubes with end fittings to take the swedged drag wires.

Two gas tanks of 75 gallons capacity each are placed in the wings. The tanks are constructed of terne plate having a 3½ inch diameter filler neck which permits filling without the use of a funnel.

The wings are pin-jointed to the side of the fuselage utilizing the entire depth of the wing for cabin space. The entire wing is covered with .014 inch dural skin, corrugated

on three-inch centers with a semi-circular corrugation. The ailerons are of the conventional type, differentially controlled and set in one foot from the wing tips.

Welded seamless steel tube construction is used throughout the fuselage. The metal skin is fastened to light dural channels riveted to clips placed on the tubes. The main cabin is 50 inches wide, 60 inches high, and 14 feet long; fitted with upholstered reed chairs secured to the floor. There is one wide door on the right side of the main cabin, and one door on the left side of the pilot's compartment. The cabin is finished in embossed Micarta board, trimmed in cloth, with aluminum strips around windows and doors. The ceiling is fitted with dome lights. There are 10 feet of continuous windows 14 inches wide on each side of the cabin. The glass is ¼ inch plate, with edges ground and polished. The glass surrounding the pilot's compartment is non-shatterable. Toilet and washroom facilities are provided, as well as a mail and baggage compartment of 40 cubic feet capacity.

A throw-over arrangement is used in the control column enabling one to fly the ship from either side of the pilot's compartment. Chain and sprocket actuated cables are run over Micarta pulleys to external horns on all surfaces. The rudder pedals are of the stirrup type. Brakes are selective, being operated by foot pedals. Complete instruments are used. Running lights are mounted to conform with Department of

Commerce specifications. Provision is also made for landing lights which will streamline into the wing.

The stabilizing device permits the balancing of the load regardless of its position in the cabin. The tail surfaces are dural channel structure, covered with standard .014 inch corrugated dural skin. The fin is adjustable on the ground in two minutes. The stabilizer is rapidly adjusted by a screw operated from the pilot's compartment and is self-locking in any position. The tail surfaces are all high aspect ratio and externally braced.

The under-carriage is of the split-axle type, constructed of heat-treated chrome molybdenum tubing. Bendix or Sauzedde 32-inch by 6-inch wheel with 36-inch by 8-inch oversize tire is used, fitted with standard brakes. The landing gear has a ten foot tread thereby assuring a steadiness in taxiing. The shock-absorbing unit is Aerol. The tail wheel, a special development, is steel mounted on ball bearings. All of these units of the landing gear have a wide safety margin and the strength of the landing gear as a unit has been clearly demonstrated by actual service tests.

Engines used are the Pratt-Whitney "Wasp," which develops 410 h.p. at 1900 r.p.m., the Pratt-Whitney "Hornet," which develops 525 h.p. at 1900 r.p.m., or the Wright "Cyclone" which develops 525 h.p. The engine mount is of the conventional type with a ring bolted to the crank case. The starter is Eclipse electric inertia operated from the pilot's compartment. The oil

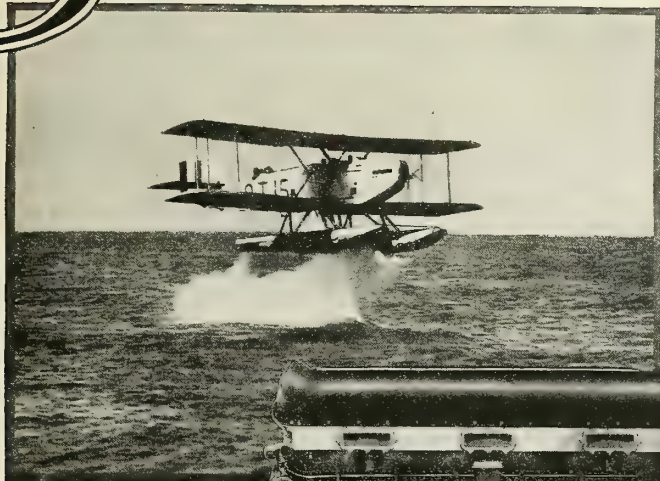
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The all-metal 8-place Flamingo monoplane produced by the Metal Aircraft Corporation.

# P

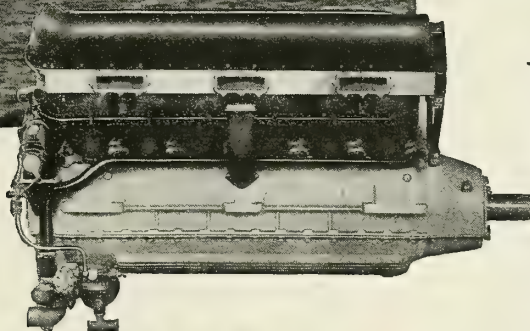
# ACKARD



Left: U. S. Navy Martin torpedo plane firing 1700-lb. torpedo. Plane equipped with 800-H. P. Packard engine.

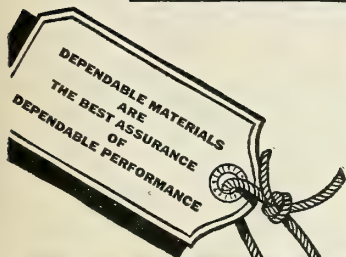
Center: Model A 2500, 800-H. P. aircraft engine mfd. by The Packard Motor Car Co., Detroit, Mich.

Below: Nickel Chromium Steel crankshaft for Packard aircraft engine.



NICKEL  
ALLOY STEEL  
PARTS  
IN PACKARD  
AIRCRAFT  
ENGINE

Crankshaft  
Gears  
Connecting rods  
Piston pins  
All studs and  
bolts



## Another famous aircraft engine manufacturer assures dependability by using Nickel Alloy Steel parts

IN United States Navy maneuvers in Southern waters last winter, nineteen Martin torpedo planes, equipped with 800-H.P. Packard Model A, direct drive engines, flew from Hampton Roads, Va. to Guantanamo, Cuba and back without a single major replacement or breakdown in any engine. The Martin plane, powered by a single Packard engine, carries a 1700-pound torpedo and a crew of three men.

The remarkable performance of these famous aircraft engines can be attributed to excellent design

and to the dependability of Nickel Alloy Steel parts. Nickel Alloy Steel is used for crankshafts, gears, connecting rods, studs, bolts and piston pins.

The outstanding performance records of Nickel Alloy Steel parts employed by all leading manufacturers of aircraft engines afford conclusive proof of the dependability of these steels.

The experience of typical users has contributed to an extensive fund of valuable technical data. You are invited to consult our engineers and draw upon this information at any time.

# Nickel

FOR ALLOY STEEL

SEND FOR "BUYERS' GUIDE TO NICKEL ALLOY STEEL PRODUCTS".



THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL STREET, NEW YORK, N. Y.





(Continued from preceding page)

tank is constructed of aluminum, 14 gallons capacity, carrying 11 gallons of oil. It is mounted forward of the firewall. The firewall is .032 inch terne plate riveted and soldered to the tubing of the engine mount and bulkhead so as to prevent any leakage of oil. The firewall is absolute protection for occupants of the passenger cabin in case of fire in the motor compartment. The engine cowling is .050 inch aluminum with louvres on each side, the front portion being adjustable for opening and closing the

louvres for warm or cold weather. The gasoline is fed from the wing tanks by gravity.

Standard equipment includes: Eclipse inertia starter, booster magneto, engine primer mounted on instrument board, engine controls, altimeter, magnetic compass, air speed indicator, clock (8-day type), turn and bank indicator, tachometer, oil pressure gauge, oil thermometer, ignition switch, pressure fire extinguisher, cabin heater, navigation lights, wings wired for landing lights, and metal propeller.

### Specifications and Performance

Designation	G-2-W	G-2-H
Power plant	P-W "Wasp"	P-W "Hornet"
	410 h.p.	525 h.p.
Length	32 feet 6 inches	32 feet 6 inches
Height	9 feet 6 inches	9 feet 6 inches
Wing span	50 feet	50 feet
Weight—empty	2,960 pounds	3,060 pounds
Weight loaded	5,600 pounds	5,600 pounds
Pay load	1,455 pounds	1,355 pounds
High speed	135 m.p.h.	140 m.p.h.
Cruising speed	115 m.p.h.	120 m.p.h.
Landing speed	50 m.p.h.	50 m.p.h.
Climb	800 ft. per min.	1,200 ft. p.m.
Cruising radius	1,000 miles	900 miles
Normal range	.7½ hours	6¼ hours

## SWALLOW TRAINING PLANE

**T**HE Swallow TP, a product of the Swallow Airplane Co., Wichita, Kansas, is designed as a practical, sturdy and easily flown two-place tandem training plane. It is equipped with dual controls, but an arrangement has been provided by which the student's rudder and stick control may be instantly disconnected to give the instructor complete control in an emergency.

The plane is equipped with a detachable motor mount, which makes it possible to install any motor from 80 to 110 horsepower. The old OX-5 motor, turning less than 1200 r.p.m., will fly the TP.

In test flights with an OX-5 motor, the plane took off in 6 seconds, with a run of less than 150 feet. The plane lands at the low speed of 30 miles per hour.

The landing gear is equipped with Rusco shock cord which is easily replaced when necessary. Roebling 5/32-inch stranded aircraft cables are used for all flying and landing stresses.

Good vision is afforded from either cockpit. Both cockpits are fitted with heavy crash pads. Right and left throttle controls, switches, radiator shutter control, carburetor choke and fuel shut-offs are provided in each cockpit. All instruments are in full view of the pilot and student. The gasoline tank has a four-gallon reserve supply.

The USA 27 wing curve, with slight modifications is used.

All surfaces are finished with pigmented dope conforming to government specifications.

### Specifications

Span	31 feet 3½ inches
Chord	5 feet
Length	22 feet 6 inches
Height	9 feet 4 inches
Wing area	297.5 square feet
Elevator area	14 square feet
Stabilizer area	14.5 square feet
Weight, empty	1260 pounds
Weight, loaded	1825 pounds
Gasoline capacity	28 gallons
Top Speed	90 miles per hour
Landing speed	30 miles per hour

## SILVER BRAZING AND SOLDERING IN AIRPLANE CONSTRUCTION

**A**N INTERESTING example of the degree to which airplane manufacturers subordinate everything to the safety factor is the manner in which they use silver solders in brazing parts of their ships or motors that are subject to vibration or are likely to encounter relatively high operating temperatures.

The German firm of Siemens and Halske uses silver solder in its airplane motors. Push rods, steel bushings, and all copper pipe connections on both fuel and oil lines, are brazed with silver. This material was employed because of its resistance to shock and vibration, as well as its ability to withstand relatively high operating temperatures.

The Wright Aeronautical Corporation uses silver solder in brazing external oil lines and push rod bushings on motors. The joints on the water pipes of the Wright marine engines are silver welded. Silver solder is used in attaching flanges at several places in the Wright Whirlwind motor and for soldering the thermocouples.

Mr. Charles H. Day, vice president of the New Standard Aircraft Corp., Paterson, N. J., and a veteran airplane designer, said: "Gasoline and oil lines on airplanes are subjected to tremendous vibration. For this reason silver solder should always be used in the brass couplings of the copper fuel and oil lines. Silver seems to be the only welding material that will be proof against such vibration."

In some makes of motors silver is used in joining feed lines to the carburetor. Some employ it in the connections of control wires and cables.

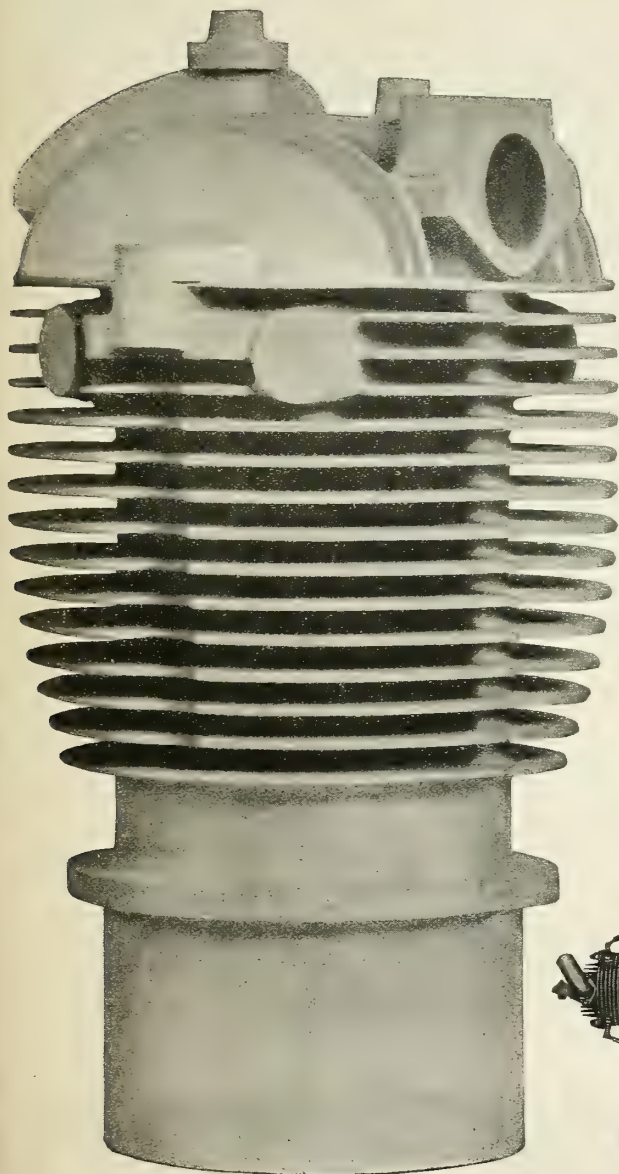
Mr. N. V. Clements of the Garden City plant of the Curtiss Aeroplane and Motor Co., replied to a written inquiry to the effect that the Curtiss company's main use of silver solder is in soldering brass connections and fittings to copper fuel and oil pipes.

U. S. Army specifications,—Bulletin 57-97 A, of April 15, 1926, together with form 57-0,—makes the use of silver solders mandatory for certain applications in the construction of army planes, notably for joining all copper tubing. "Silver-welding" in some form is standard practice in the industry. Silver solders fuse at from 1600°F down to 1325°F according to their silver content, the higher the silver the lower the fusing point. In addition to their strength, toughness and resistance to relatively high operating temperatures, they are described as having even a higher factor of electrical conductivity than copper; which explains their use in securing resistance wire to terminals and leads, in radio resistors, or in all other places where it is important that resistance be kept at a certain value. Commercial silver solders have recently been standardized to a dozen definite formulas; the richest mixture has 80 per cent silver and the leanest 10 per cent with various proportions of base metals. Silver solders are usually sold by the Troy ounce, in the form of wire, strips, sheets and filings. They are applied by means of oxy-acetylene or other welding and brazing torches. Although called "solders," their function is usually that of a brazing medium.



The OX-5 engined Swallow TP two-place training plane.

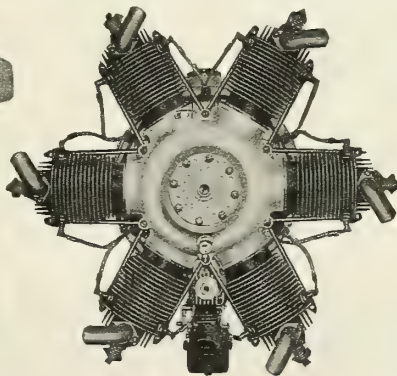
# LET CHENEY SOLVE *your* Foundry Problem



Cheney Cylinder for  
Brownback Motor


The problems involved in producing satisfactory castings for air-cooled cylinders at a reasonable cost now loom large in the minds of most motor manufacturers. Many of them do not know that the Cheney organization has specialized for twenty-five years in the manufacture of air-cooled cylinders, and is prepared to furnish cylinder castings either rough or machined, to the specifications of any responsible manufacturer.

Cheney research has developed a successful foundry technique for handling the difficult shapes and the unusual alloys used to give maximum strength with minimum weight. Some of the results obtainable by the use of these alloys may surprise you.



If you are ready for real production, Cheney can solve this difficult foundry problem to your satisfaction.

Brownback Model C-400 Motor. Equipped with Cheney Cylinders.

  
**S. Cheney and Son**  
 MANLIUS, N.Y.



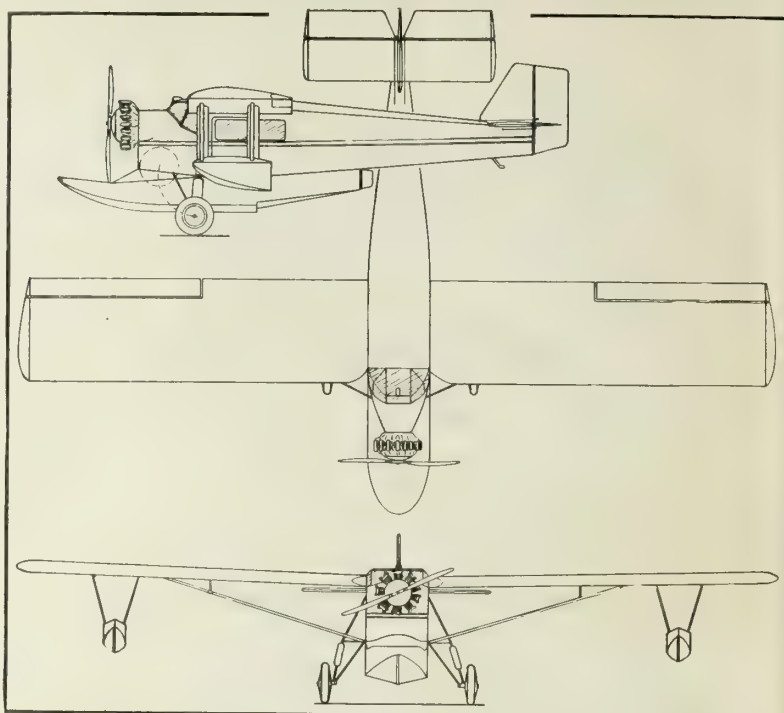
# COLUMBIA TRIAD AMPHIBION

**P**RIMARILY an amphibion, yet built upon a principle whereby it may be transformed quickly to a land or a seaplane, the Columbia Triad 5-passenger monoplane embodies in one construction the essentials of three separate airplanes, is serviceable at all times, convertible to any special occasion, and adjustable to landing contingencies. The Columbia amphibion, Triad, was developed and recently test flown by Columbia Air Liners, Inc., of which Charles A. Levine, trans-Atlantic air traveler, is president. The amphibion was built to the designs of Lee Worley, chief engineer, and construction was carried out under the direction of A. S. Blumenthal, factory manager, and Warner Tilsher, general foreman.

Special attention was paid to the possibility of devising a strong, light, completely serviceable hull which could, with a minimum of effort, time, space and possible accident, be detached from the fuselage, leaving a typical land plane. This consideration in time brought about a design in which only four bolts were necessary, these being placed forward and behind the center of the fuselage. At rest as an amphibion on the field or in the hangar, short supports are thrust under the hull. The bolts are released and the hull comes to rest upon the supports. The ship is then pulled backward over and away from the hull, leaving the two portions free of one another. To convert the plane to an amphibion again from this point the reverse method is followed, the bolts tightened and the supports pulled away.

The hull is constructed of duraluminum and wood, and weighs approximately 300 pounds. With the hull attached, and by means of a single operation, the landing gear and wheels may be removed, thus leaving the craft a seaplane.

Successful trial flights have been made with the J-5 225 horsepower Whirlwind, but due to the fact that the Triad was designed for the 300 horsepower J-6 Whirlwind, no speed or climb tests have yet been made. The gasoline capacity is 64 gallons, which



Outline drawings of the Columbia Triad Amphibion monoplane.

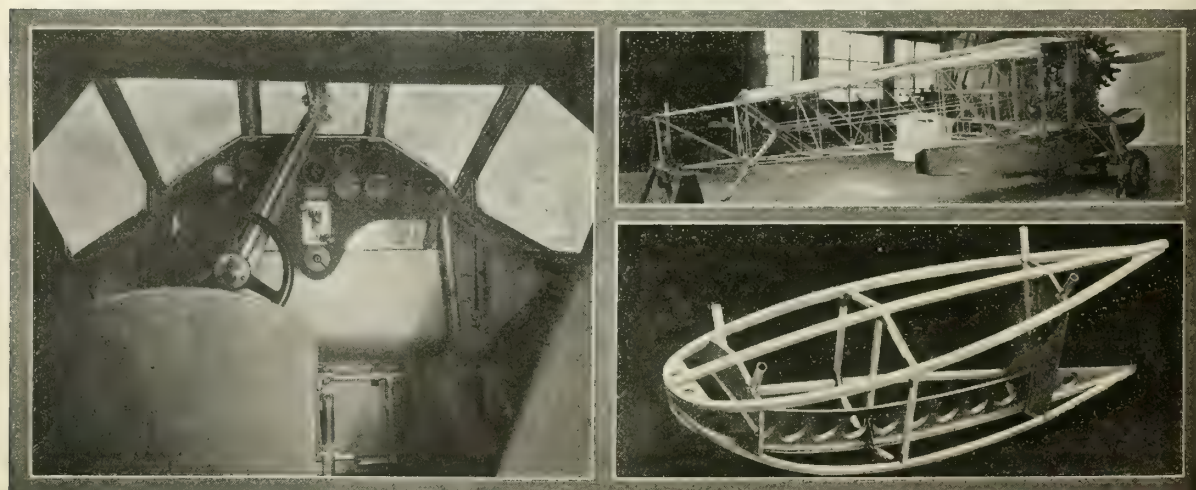
gives the Triad a cruising range of about five hundred and fifty miles.

With a 300 horsepower air-cooled motor (the new Columbia air-cooled engine) and with a wing span of forty-nine feet, the Columbia Triad seats comfortably five passengers in addition to the pilots. Appointments in the passenger cabin are much as those to be found in the tonneau of sedan and limousine automobiles, and the arrangement is also much the same. All seats are upholstered in cloth or leather, and each passenger may peer from a separate window, the lowering and raising mechanism of which is operated by conventional crank handles.

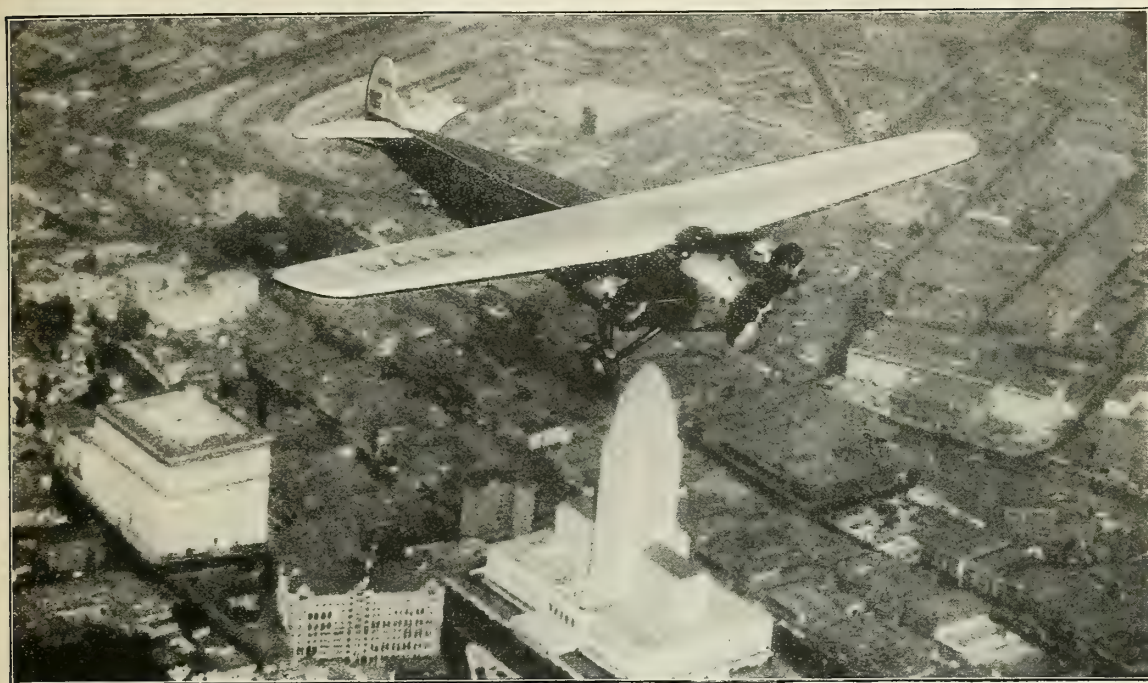
In the pilot's cabin, which is separated from the main cabin by a small door, is an extra seat, for mechanic or second pilot. Both are so arranged as to be equally suitable for flying the ship. An overhead control device and wheel is used which may be swung into position in front of each seat. Indestructible glass windows in the front, to the sides and overhead give unobstructed vision while flying.

The construction of the fuselage is of chrome moly tubular steel, welded at each joint, the whole being covered with regulation airplane fabric. Passengers and pilot

*(Continued on next page)*



Pilot's controls, and construction details of the Columbia Triad. The view above shows a wing float framework.



## The Fokker Reputation

ASK the world's largest airline operators why they buy Fokkers, and they will sum up with the reply, "We choose Fokkers because of their performance."

What stands behind this statement? To be so powerful, a reputation must be founded on many years of safe and successful operation. To build such faith, aircraft must serve steadily and economically over a long period of time. To satisfy so many owners, under such a great variety of financial, climatic and operating conditions, an airplane builder must deliver the refinements of design and construction which can result only from the widest experience in every phase of military and commercial performance. *That is reputation!*

One of the most extensive airline systems in North Amer-

ica started with a few single-engined Fokkers, later added several planes of other builders, and, based on this positive experience, now use a large fleet of Fokkers exclusively. The biggest operator on the West Coast inaugurated its passenger lines with Fokkers of a type never before built, ordering a fleet of these giant Trimotors *on the Fokker reputation alone*. In another case, a great international transportation system\* adopted Fokkers at the outset, and following a signal success, is rapidly increasing its fleet with F-10 Trimotor airliners.

The great majority of Fokker owners—whether flying the transport or the touring types—sooner or later indorse the Fokker reputation with their repeat orders.

\*Names of these and many other owners, on request.

FOKKER AIRCRAFT CORPORATION OF AMERICA

Factories: Wheeling, W. Va., and Teterboro Airport, Hasbrouck Heights, N. J.

Address Inquiries: NEW YORK OFFICE, 110 East 42nd Street





(Continued from preceding page)

enter the ship through large side doors.

The landing gear is operated by hydraulic pressure, the control of this device being situated between the two seats of the pilot's cabin, and within easy reach from either the left or the right. A minimum of physical effort is required to raise or lower the wheels, which, when raised, rest alongside the side windows of the forward cabin.

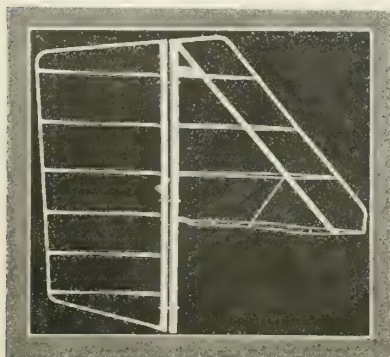
Other features of the Triad include a large gum rubber bumper on the prow of the hull as an added safety factor while the ship is afloat. This bumper is approximately five inches in thickness through its center section and is attached by cement so that in case of accident a new rubber may be applied in a few minutes.

In seeking to make the plane as easily handled on the water as on the ground or in the air, a small water rudder is used at the stern of the hull; this rudder is operated by the same mechanism as the air rudder, and in this way adds a double advantage. An extra tail-skid has also been incorporated into the general construction, this being attached to the very end of the fuselage. The regular skid is equipped with additional wire braces to preclude against any possibility of the skid-arm protruding through the fuselage.

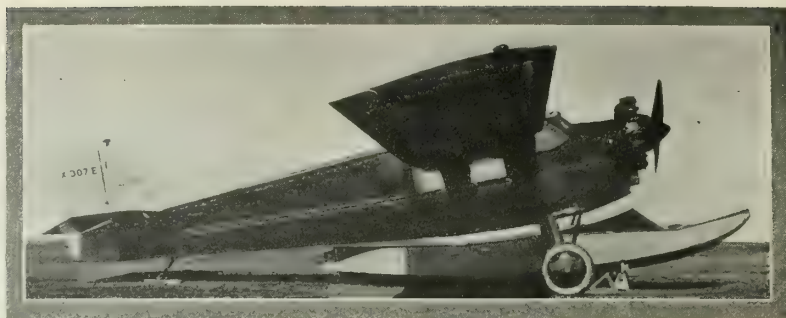
The amphibion is equipped with a Pioneer instrument indirectly lighted panel in the pilot's cabin, which includes altimeter, tachometer, oil pressure gauge, oil thermometer, primer ignition switch starter control, navigation light switch and motor self-starter control. A welded aluminum tank of special design is located in the fuselage almost directly over the center of gravity. A quadruple system of outlets from this tank insures a positive flow of fuel to the carburetor at all times regardless of the position of the plane in flight. This arrangement also has the distinct advantage of offering no difficulty in case the wings are removed, for no pipe lines are outside the fuselage necessitating disconnection.

Brief specifications of the new Columbia amphibion are as follows:

Wing span .....	49 feet
Wing chord .....	81 inches
Length overall .....	33 feet
Height .....	9 feet
Wheel tread .....	9 feet 4 inches
Wing area .....	324 square feet
Wing loading .....	11.7 pounds per square foot



Columbia Triad fin and rudder skeleton framework of welded steel tubing.



Columbia Triad convertible amphibian with float detached.

Power loading .....	12.65 pounds per horsepower
Weight gross .....	3800 pounds
Fuel capacity .....	64 gallons
Oil capacity .....	6 gallons

## THE 9-INCH JUNIOR SOUTH BEND LATHE

THE 9-Inch Junior New Model South Bend screw cutting precision lathe is made in five lengths of bed.

It can be had in bench type or floor leg type, with countershaft drive or four styles of motor drive. It is practical for the machining of all kinds of metal, such as: steel, cast iron, wrought iron, brass, bronze, copper, aluminum, babbitt and others. It may also be used for the working of wood, hard rubber, fibre, and other composition materials.

The semi-steel lathe bed is a heavy gray iron casting containing about 18 per cent steel.

The headstock is back geared. The three-step cone permits six spindle speeds, three direct cone drive and three back geared drive. All gears are covered with gear guards to comply with the safety laws. A quick-acting bull gear clamp permits changing from direct cone drive to back geared drive, or vice versa, without the use of a wrench.

The headstock spindle is made of special quality carbon spindle steel. It has a 3/4-inch hole which permits rods, bars and tubing to be passed through it and held in a lathe chuck or draw-in collet chuck for machining. This spindle is finish ground all over. The steel thrust collar is hardened and ground.

Phosphor bronze bearings for the headstock spindle are high quality bronze, designed for heavy duty work and are adjustable for wear. These bearings are hand scraped to fit the spindle.

The carriage is strong and deep with a wide bridge capable of supporting a heavy cut. A locking device fastens the carriage to the bed when doing facing work or cutting-off. The saddle of the carriage is hand scraped to the lathe bed. The cross feed screw is fitted with a micrometer collar graduated in thousandths of an inch.

The apron is provided with a pair of half-nuts which are fitted and hand scraped and held by ribs. The power longitudinal feed is obtained by clamping these half-nuts on the lead screw. This feed has

plenty of power, for it is operated by the feed gears at the head end of the lead screw.

The compound rest is graduated to 180 degrees on the base and can be swivelled to any angle on the horizontal plane and operated at that angle. The compound rest top has an angular travel of two inches. The compound rest feed screw is fitted with a micrometer collar graduated in thousandths of an inch.

The lead screw is a precision screw made of special steel with an Acme standard thread which insures the utmost accuracy. This lead screw meets the requirements in cutting the finest precision threads for taps, dies, gauges and other threaded tools.

The tailstock is heavy and rigid with a long bearing surface on the bed. The tailstock spindle is graduated on top in sixteenths of an inch which permits the operator when using a drill chuck in the tail spindle to measure the depth of the drill into the work. The tailstock top is provided with a set-over for turning or boring tapers. The tail center is hardened and ground and is self-ejecting.

Longitudinal power feed has a range of fine to coarse feeds which are adjusted by the aid of the change gears which are attached to the head end of the lead screw. This feed can be operated to make the carriage travel either right or left because of the spring latch reverse at the head end of the lathe.

Thread cutting capacity permits cutting standard screw threads from 4 to 40 per inch, including 11 1/2 pipe thread, right or left hand.

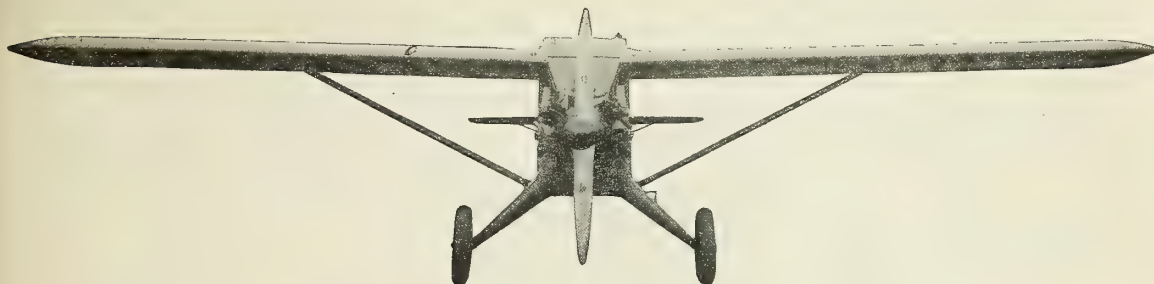
The life of the 9-inch junior new model lathe, is estimated to be at least twenty-five years and if given the proper care and attention it will last much longer, because it is a substantially built lathe.

Attachments such as: draw-in collet chuck, milling and keyway cutting attachment, taper attachment, grinding attachment, bed turrets, tool post turrets and many other attachments make this lathe practical for a great deal of special work.

The South Bend Lathe Works was established in South Bend, Indiana, in 1906, and has operated continuously for twenty-two years under the same management, devoting its entire time to the building of back geared screw cutting lathes.

Lathes of this type are giving good service in many American aircraft factories.

# Safer and Better Performing Airplanes



*Front View of Aristocrat Cabin Monoplane  
Illustrating the Trim Basic Design of All GAC Airplanes*

A YEAR ago when the personnel of the General Airplanes Corporation was announced aeronautical circles began to look forward to better airplanes, because the engineers and manufacturing executives of this organization, with an average experience of more than twelve years in America and Europe, were recognized as leaders of advanced design.

Today GAC airplanes, after months of hard usage, have fully justified that expectation.

The Aristocrat Three-Place Cabin

Monoplane is recognized in the industry as having established new high standards of safety and performance.

World-famous pilots are enthusiastic in their praise. They talk about its ease of handling, quick take-off and easy landing.

It is as comfortable for winter flying as a closed automobile.

Cost of operation and maintenance are surprisingly low.



*Aristocrat now being used by Commander Richard E. Byrd in his Antarctic Explorations.*

Strictly a quality product, the Aristocrat is the ideal airplane for the business executive, the well-to-do young man and others who demand the best. It

also enables air-taxi operators to furnish safe, comfortable, low-cost air transportation.

## A Complete Line

General Airplanes Corporation manufactures a complete line of commercial airplanes of advanced design, all conforming to the specifications of the U. S. Army, Navy and Department of Commerce, as well as the I. C. A. N.



**Dealers:** *Perhaps your territory is still open.  
Wire or Write for our Attractive Offer.*



GENERAL AIRPLANES CORPORATION, 553 Abbott Road, Buffalo, N. Y.



# KNOLL KN-1 CABIN PLANE

THE Knoll Aircraft Corporation is aligning its plant for immediate quantity production on the KN-1. The new plane is a four-place biplane which incorporates some of the ideas developed by Mr. Felix A. Knoll while an engineer for the Rohrbach All-Metal Airplane Company and the Heinkel Aircraft Company in Germany, as well as features typical of up-to-date American construction. Howard Jones, who took the plane up for its initial flight on December 30, was so delighted with the way the ship handled in the air that he put it through the complete roster of stunts, including loops and power dives before landing.

The first machine is equipped with a Wright Whirlwind J-5, but the machine is designed to accept practically any power plant within this power range, one of the features being a unique engine mounting which permits the entire power plant and its accessories to be dismounted as a unit and enables an entire change of engine to be made in less than 30 minutes.

In general the plane is a single bay biplane with thick wing sections, the top wing being considerably larger than the lower wing, the fuselage being extremely roomy and somewhat shorter coupled than usual. The lower wing is set at a 4 degree dihedral, the upper wing having none, while the upper wing leads the lower wing with a 2' 8" stagger. The plane has a total effective aerodynamical area of 264 square feet and a gross weight of 3050 pounds, giving a loading of little more than 11 pounds per square foot.

Some of the interesting features of construction are the placement of the entire fuel supply in the upper wing and a unique method of rib construction which permits the entire central part of the upper wing to be filled with tanks. Considerable attention has been given to practical disposition of the fuel supply and all fuel lines are carried outside the fuselage, making them always available for inspection and simplifying the problem of quick change of power plant.

The ailerons, which provide an area of 23 square feet, are of the Lachman type and according to the test pilots have proven very effective in giving ease of lateral control under all conditions. Both rudder and elevator are balanced and are adjustable so that the machine will fly hands-off under all load conditions. Control of the stabilizer

incidence is effected by turning a hand wheel.

The landing gear is of the split axle type, with a 6 feet 4 inch tread carrying 28 by 4 inch wheels and the tail skid is steerable with all parts easily removable and interchangeable.

Fuselage construction is of welded seamless steel tube construction throughout, while the main wings are carried on built-up spars with spruce flanges and birch plywood webs. The fuselage is for the most part fabric



Side view of the Knoll KN-1.

covered, but the entire surface of both wings is of plywood construction, a factor which adds considerable strength and which, in combination with a new type of rib construction, makes possible the elimination of all interior bracing in the wing structure.

The roomy cabin provides comfortable seating accommodations for four. The fuselage is provided with three accessible doors. The rear compartment, being used in the present model as a baggage compartment, can be converted to a passenger compartment if desired, giving a seating capacity of six.

The cabin arrangement provides good visibility for both pilots and passengers and the disposition of the doors makes it comfortable to get in and out of. The plane is fitted with a Standard Steel propeller and dual control if desired. Air speed indicator, altimeter, tachometer, oil temperature, oil pressure, turn and bank indicator, 8-day clock, fire extinguisher, first aid kit and navigation lights are fitted as standard equipment. An inertia type starter is used and the color finish is optional with the owner.

One interesting feature of the KN-1 is its large fuel capacity. The standard tank system, giving a maximum capacity of 142 gallons, which at a fuel consumption of 12 gallons per hour at a cruising speed of 110 miles per hour provides an effective cruising range of practically 1200 miles.

Attention has been given to making necessary routine maintenance and inspection as easy as possible, and in addition to the ease with which the power plant may be detached, all control surfaces and members which should receive regular inspection have been made accessible and easily detachable.

## Specifications

Span, upper wing.....	33 feet 6 inches
Span, lower wing.....	28 feet 6 inches
Chord, upper wing.....	5 feet 5 inches
Chord, lower wing.....	3 feet 7 inches
Length overall.....	23 feet 3 inches
Height overall.....	9 feet 0 inches
Total wing area.....	264 square feet
Weight empty.....	1800 pounds
Pay load.....	580 pounds
Disposal load.....	1250 pounds
Normal gross weight loaded.....	3050 pounds
High speed (at 1800 r. p. m.).....	130 miles per hour
Cruising speed (at 1600 r. p. m.).....	110 miles per hour
Landing speed.....	45 miles per hour
Rate of climb.....	13 feet per second
Time of climb to 10,000 feet.....	12 minutes, 50 seconds
Service ceiling.....	14,000 feet
Fuel capacity .....	142 gallons
Normal range (approximately).....	1200 miles

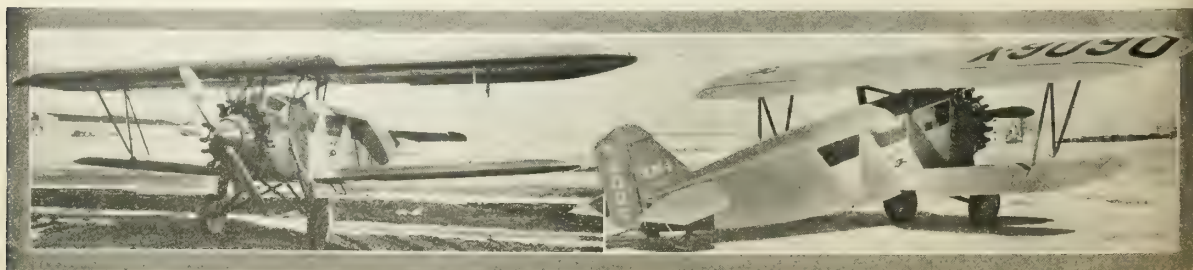
## DEVICE FOR PICKING UP AIR MAIL POUCHES

A DEVICE has recently been patented by Dr. J. Brown Davis of Daytona Beach, Fla., by means of which airplanes may take on mail pouches or other parcels without having to land.

With the use of this device a large area of ground space is not needed in order to place a city on the air mail service, for it may be constructed on the roof of the post office building, which insures safe, speedy handling of the mail.

The present charge by carrier contractors for mail is approximately forty cents per pound, which rate depends largely upon the volume. With the increased tonnage hauled where these smaller cities are included in a given mail route the rate per pound could be materially reduced. This fact, together with the other advantages enumerated, means more satisfactory service in air mail.

Growth in volume along a given route would come from a source which at present is not touched except indirectly where the mail has to be handled and rehandled.



The Knoll KN-1 four-place cabin biplane powered with the Wright J-5 engine.

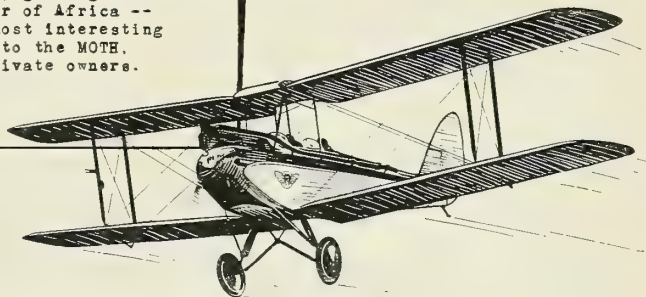
# INCOMING CABLE Jan. 30, 1929

My African tour by MOTH has convinced me of the absolute comfort and safety of long distance travel by light airplane. Owing to ease of journey from London to Capetown, decided to return off the beaten track with view to sight seeing, although without adequate maps, organization, or supplies. Plans completely successful due to thorough dependability of MOTH, despite lack of skilled attention during last 13,000 miles. Never a dull moment flying over endless panorama of mountains, deserts, lakes, gigantic rivers, and dense forests, gaining impression of the true beauty and grandeur of Africa -- most impressive from above. It was the most interesting travel-free holiday ever spent -- thanks to the MOTH, justly famous as the ideal machine for private owners.

(signed) Lady Bailey

## Guaranteed Performance of Standard Moth Landplane

Top Speed . . . 103-105 M. P. H.  
Cruising Speed . . . 85-90 M. P. H.  
Stalling Speed . . . 41 M. P. H.  
Rate of Climb . . . 700 feet min.  
Ceiling . . . 18,000 feet



# MOTH RELIABILITY

## Again proved by 18,000-mile tour around the Continent of Africa!

FROM London to Capetown and return . . .  
over mountain ranges and trackless jungles  
. . . where landing was impossible . . . Lady  
Bailey piloted her D.H. Moth comfortably, safely.

Now, the Moth brings to American owners the same care-free reliability that made Lady Bailey's solo flight such a startling success. The de Havilland differential control system gives exceptional safety and stability in the air or landing, which can be still further increased by the use of the famous slotted wings. You can fly the Moth "hands off," even in rough weather. Controls are light and perfectly harmonized. Cockpits are comfortable and free from draughts. Visibility forward and down is good, from front or rear seat.

Cost of operation is exceptionally low. About 20 to 18 miles per gallon of gas at cruising speed of 85-90 miles per hour. The famous Gipsy engine is simple, dependable—requires no more attention than your automobile motor.

And the Moth will take you where other planes can't go. Land on any field—on a road in an emergency! Fold the wings (easy even for a woman), and any garage or shed is your hangar. So light you can lift the tail and push your Moth over roads and fields. Uses any gas or automobile oil—you can fill up at a roadside station if necessary. The Moth makes you independent of airports. Go where you will on pleasure or business—all the world is yours, with a Moth!

**To Prospective Moth Owners—**  
We suggest ordering **now**, as we expect our early production to be greatly oversold.



**To Dealers—**We are now ready to extend the Gipsy Moth franchise to responsible dealers, whose inquiries are solicited.

LICENSEE: THE DE HAVILLAND AIRCRAFT CO., LTD.

# MOTH AIRCRAFT CORPORATION

GRAYBAR BUILDING, NEW YORK . . . FACTORY, LOWELL, MASS.



# BOEING MODEL 95 MAIL PLANE

**S**ATISFACTORY flight tests of the new mail plane Model 95, designed to handle mail and express only and based on the operating experience of the Boeing Air Transport and Pacific Air Transport organizations were recently completed.

On its flight tests, the ship took off with a full load in 10 seconds with a run of 525 feet, and climbed to 7,550 feet altitude in 10 minutes. It made a top speed of 140 miles per hour, and landed at 53 miles per hour. The plane is powered with a Pratt & Whitney Hornet engine developing 525 horsepower. A 10-foot 6-inch adjustable metal propeller is used.

Four mail and express compartments, to-

talling 89 cubic feet, have a cargo capacity of 1,600 pounds. The forward mail compartment has a 25 cubic foot capacity; the intermediate compartment, a 20 cubic foot capacity; the aft compartment, 35 cubic foot; and the express section, a capacity of 9 cubic feet. The fuselage is of steel and dural construction with dural covering back to the pilot's cockpit and fabric covering from that point to the tail section. Wings are built up of spruce box spars fabric covered. Rib construction is of spruce and mahogany plywood. The ailerons are of metal frame and cover. Control is by stick using full rod control to ailerons and elevators. Foot pedals are adjustable to three

positions for the rudder. Rod control is provided for elevator, aileron, and stabilizer. Among the special features of this plane are electric inertia starter, Boeing type oleo landing gear and steerable tail skid, Bendix wheel brakes which may be operated separately or together from rudder pedals, internally mounted parachute flares with Boeing release mechanism, oil cooler with shutter control, retractable landing lights controllable by the pilot, cockpit heating system, adjustable pilot's seat, and control surfaces of all-metal construction.

The following instruments are standard equipment: compass, bank and turn indicator, airspeed meter, altimeter, climb indicator, special bank indicator, tachometer, clock of the "time of trip" type, gasoline and oil pressure gauges, and oil temperature gauge.

The landing gear, of alloy steel construction, is of the cross axle type. It has a tread of 88 inches. The wheels are 36 x 8.

The planes will be finished according to the color scheme which universally identifies Boeing equipment—Boeing Green body, aluminum colored wings with the exception of the upper surfaces of the upper wing which are chrome yellow, and with aluminum colored tail surfaces edged with "Boeing Green."

## Specifications

Length overall.....	31 feet 11 inches
Height overall.....	12 feet 1 inch
Wing span, upper.....	44 feet 3 inches
Wing span, lower.....	39 feet 6 inches
Chord, lower wing.....	.66 inches
Chord, upper wing.....	.86 inches
Stagger.....	27 degrees
Dihedral.....	2 degrees
Incidence, upper wing.....	1½ degrees
Incidence, lower wing.....	2½ degrees
Wing area (including aileron)	490 sq. feet
Total aileron area.....	.35 square feet
Total stabilizer area.....	.39.1 square feet
Total elevator area.....	.28 square feet
Total rudder area.....	.13.8 square feet
Total fin area.....	.7.1 square feet
Wing section, upper.....	Boeing No. 10
Wing section, lower.....	Boeing No. 10
Weight empty.....	3,196 pounds
Useful load.....	2,644 pounds
Fuel (767 pounds).....	130 gallon
Oil (97 pounds).....	12.5 gallon
Actual pay load.....	1,610 pounds
Gross weight loaded.....	5,840 pounds

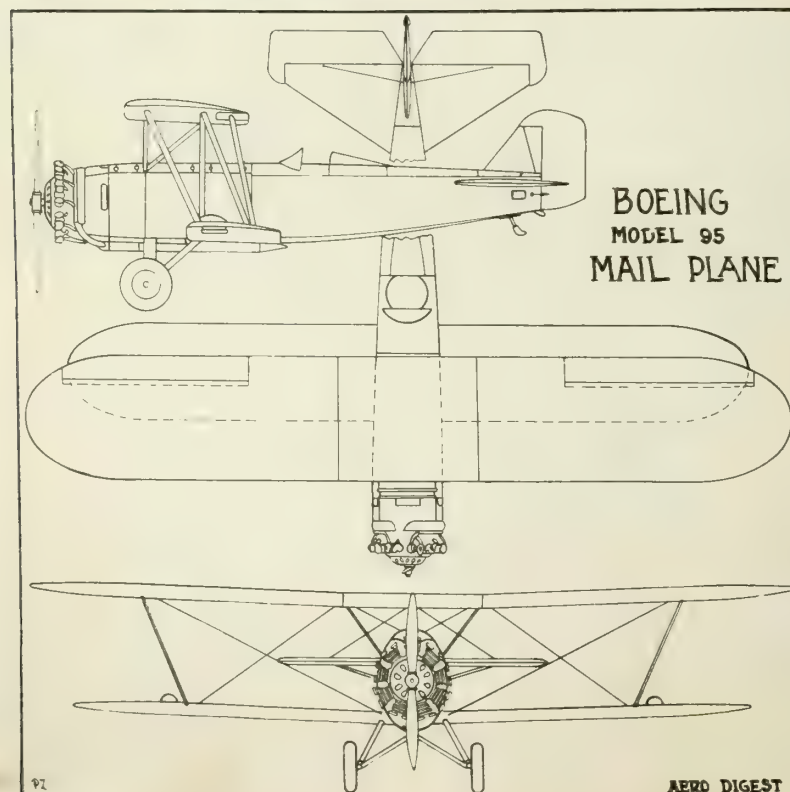
## Performance

(With 1,610 pounds Pay Load).

High speed (prop setting—16°).....	140 miles per hour
High speed (prop setting—17°).....	142 miles per hour
Landing speed.....	56 miles per hour
Rate of climb.....	.950 feet per minute
Climb in 10 minutes.....	7,350 feet
Time to 10,000 feet.....	15.4 minutes
Service ceiling.....	16,000 feet
Take-off run.....	.540 feet
Take-off time.....	11.6 seconds
Wing loading.....	11.9 pounds per square foot
Power loading.....	11.1 pounds per horsepower



The Pratt & Whitney engined Boeing Model 95 mail plane.







THE enthusiasm of experienced pilots and instructors who have flown the Mohawk "Pinto" is a self-evident tribute to the all-round practicability of this light, low-winged monoplane. They recognize, from the design, construction and operation, that it combines safety, dependability, handling ease and economy to a greater extent than any other plane in its class. It is proving its worth as a training plane and in every day use for business and pleasure.

Valuable territories are still available for responsible dealers. Wire or write for complete information about the Mohawk Sales Franchise.

## Mohawk Aircraft CORPORATION

2637 Delaware St., S. E.

Minneapolis, Minn., U. S. A.

U. S. Department of Commerce Approved Type Certificate No. 95



# SCOUT MONOPLANE

**T**HE new Scout low-wing monoplane recently tested by the Scout Airplane Company of Los Angeles, is an unusual departure from the conventional types so far developed in this country. It was designed by M. C. Tunison, and built under his supervision. Jimmie Angel, pilot for the company, made the flight tests. Powered with a Wright Hispano H3 engine of 300 horsepower, a top speed in excess of 200 miles per hour and a cruising speed of 165 miles per hour were attained. The plane showed excellent maneuverability, balance, and stability.

That the streamline design is aerodynamically correct is evinced by the high speed attained. Built entirely of laminated plywood, the Scout differs greatly in appearance from the ordinary type of plane. The streamline is carried out in the shrouded landing gear. The wing, which is hollow, is in one continuous piece, without spars. There is sufficient room inside for a man to crawl from tip to tip and there is no external bracing to offer head-resistance.

With the exception of the rudder and stabilizer each unit is mounted directly to the wing. The motor mount is fastened to the leading edge, the landing gear to the under surface, and the fuselage fits snugly to the top surface. This method of assembly results in perfect alignment as well as a rigid and vibrationless plane.

A new method of laying plywood gives unusual strength. Any portion of the wing will bear the weight of a man. In recent tests twenty people stood in a line on the

wing from tip to tip.

M. C. Tunison is developing a new motor to power the production models.

An outstanding feature, from a manufacturing standpoint, is the simplicity of construction which will result in a selling price much lower than might be expected for a plane with the Scout's performance.

## Specifications

Wing span.....	36 feet
Length.....	29 feet
Height.....	7 feet
Maximum Chord.....	12 feet
Chord at wing tip.....	5½ feet
Wing area.....	270 square feet
Power (Wright Hispano H3)	300 horsepower

Rate of climb.....	1,000 feet per minute
High speed.....	200 miles per hour
Cruising speed.....	165 miles per hour
Landing speed.....	45 miles per hour

## PISTON DISTORTION

By John T. Omen,

Research Engineer, Air-Way Oil Co.

**I**NVESTIGATION of irregular cylinder and piston wear proved in practically all cases that most of such wear is due to piston distortion. Improper methods of fitting wrist pins and handling pistons generally cause this distortion. It is therefore unwise to assemble any motor without first ascertaining, by the use of a micrometer, whether or not the piston is perfectly round.

Sometimes the slightest rap causes the piston to go out of round. If undue stress

has been placed on the piston in handling, this distortion is rather high. No trouble will be encountered in rounding out the piston, for a few raps on the high sides with a wooden mallet or block generally brings it back into shape.

A wooden block conforming to the diameter of the piston is a great aid in preventing distortion when wrist pins are being removed or replaced.

## NICHOLAS-BEAZLEY CORRUGATING DIE

**A** NEW corrugating die for corrugating sheet duralumin has been designed and developed by P. O. Gibson, director and supervisor of production of the Barling NB-3 monoplane manufactured by the Nicholas Beazley Airplane Co. of Marshall, Mo. The new die increases the speed and accuracy of corrugation.

Used in a double acting toggle press, this new die requires but a minor, quickly-made adjustment in order to corrugate sheeting that varies in thickness. It has a sensitive adjustment for controlling the depth and pitch of corrugations.

Material is corrugated by insertion into an adjustable "key" or entering die, and passing successively through this entering die, it is held in place and further shaped by a shaping die which is concentrically opposed to the key die on the toggle press.

## RELATION OF PRODUCTION COST TO QUANTITY IN AIRPLANE MANUFACTURING

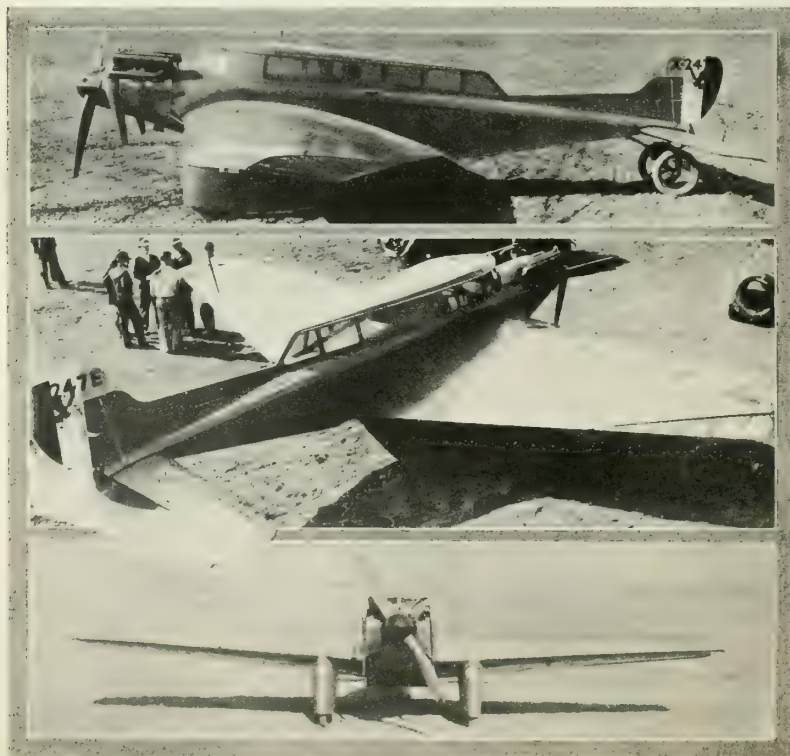
Abstract of a paper presented by L. C. Milburn at the Aeronautic meeting, Society of Automotive Engineers, Chicago, December, 1928.

**C**URVES showing the relationship between quantity and cost might be expected to drop smoothly from high cost for a few units till they approach a horizontal line of minimum cost. Mr. Milburn shows that, on the contrary, they are irregular because of factors like improved materials, tools and methods for fabrication, which make sudden changes when they are introduced.

To reduce sales resistance, it is necessary to fix prices on the predicted cost of an assumed quantity, according to the author; but a theoretical cost curve extending beyond the range of practical experience may prove a snare, because predicted costs often fail to be realized.

Explanation and examples are quoted for the tendency to adopt pressed-metal construction in place of wood and welded-steel tubing for quantities that justify the tool cost involved.

Design, tooling and labor cost are said to be interrelated, and the amount of floor area required influences the manufacturing cost. Efficient time-scheduling brings parts to assembly at the right time, without storing. There is continual need of speeding up a lagging operation.



The streamline design of the Scout monoplane is shown in these views.



# Minds that speed the flight of wings

... that flight may be more enduringly beautiful

**T**HE new world of the air makes still sterner demands of materials. Never before did industrial finishes have to withstand such drastic changes of temperature, such enormous stress and strain, such extraordinary conditions of air friction.

Air-minded chemists in the du Pont laboratory quickly realized and met these new demands. Du Pont aircraft finishes were instantly recognized as unique achievements. Wing dopes, body finishes, enamels, varnishes, brought new, enduring beauty to aircraft, withstood the most gruel-

ling laboratory and actual flying tests. Ordinary finishes were superseded by these marvelous new finishes.

## *Color and style in flight*

The new mode of travel also demanded an utterly different technique of color visibility. Hand in hand with optical and aviation experts, du Pont Color Advisory Service developed a completely new line of shades and tints that perfectly meet your requirements for visibility.

But mechanical excellence and vis-

ibility were not enough. This modern mode of travel needed style treatments that would set your ships apart. Du Pont Color Advisory Service brought to the aircraft maker the style genius of two continents. New beauty, new distinctiveness now characterized the ships of leading makers.

Let us assist you in developing new finishing techniques.

Complete information on any du Pont product for airplane use will be furnished promptly by mail or by a qualified representative.

## AIR TESTED FINISHES

**Du Pont Dopes**—The du Pont line of aircraft finishing materials includes clear, semi-pigmented and pigmented dopes. They are all tested formulas of remarkable durability—proven in service as well as in the laboratory. Flexible and highly blush-resistant, the Army and the Navy have approved these products for their requirements. Available in a wide variety of highly visible colors.

**Du Pont Paints and Varnishes**—Du Pont chemists have developed a complete line of paints and varnishes including Dopeproof Paint, Spar Varnishes, Fuselage Varnish and Aircraft Enamels.



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MEMBER OF AERONAUTICAL CHAMBER OF COMMERCE

Say you saw it in AERO DIGEST



# CIRRUS MARK III ENGINE

**T**HE American Cirrus Engine Company, which is to build British Cirrus engines in this country, will start deliveries in approximately four months.

Cylinders of the Cirrus engine are four-in-line vertical. Cylinders and cylinder heads are separate, the cylinders being of cast iron and the cylinder heads of aluminum alloy with air-cooling fins cast on each. The cylinders are spigoted into the crankcase and into the heads, the joints between the cylinders and heads being made by copper and asbestos gaskets. The cylinder heads may be easily removed without taking down the engine. The complete cylinder with head is secured to the crankcase by means of four studs projecting from the crankcase and passing through holes in the cylinder head.

In the cylinder heads, special bronze seats for the exhaust and inlet valves are screwed and expanded into position. The valve guides, which are a force fit in the heads, are of phosphor bronze.

Provision is made in each cylinder head for two spark plugs, two bronze screwed bushes being fitted.

In the crown of each cylinder head, one inlet and one exhaust valve is fitted. Both valves are operated by means of push rods in conjunction with the tappet rods located in the upper part of the crankcase. The tappets are actuated directly by the camshaft.

Rocker arms are carried on a separate steel bracket, which is bolted to the top of the cylinder heads.

The pistons are aluminum alloy castings, the crowns of which are adequately reinforced on the underside by cross webs. They are fitted with three piston rings of cast iron. The lowest of these rings also acts as a scraper ring, inasmuch as a groove is turned in the piston immediately below it, and a number of small holes are drilled around this groove through which oil can escape into the inside of the piston. This arrangement prevents any excess oil on the cylinder walls from finding its way into the combustion chamber.

The hollow piston pin is of the full floating type; that is to say, it is free to turn both in the housings in the piston and also the small end of the connecting rod.

The connecting rods are made from duralumin forgings of "H" section. The cap of the big end is secured to the rod by two bolts, and the big ends are fitted with die-cast white metal bearings. On the back of the bearing cap a dowel is provided, cast integral with the bearing, which registers into a recess in the cap and prevents rotation of bearing. As an alternative, phosphor bronze white metal lined big end bearings can be supplied.

The four-throw crankshaft is of solid construction, and an extension forming the propeller shaft is secured to the forward end by means of a keyed cone hub and bolts. The complete shaft rotates in five bearings, viz, three die-cast white metal center bear-

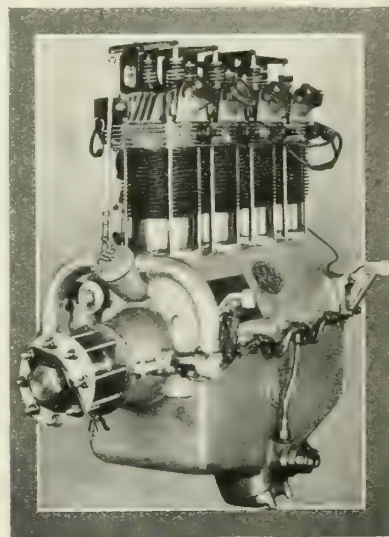
ings, and a roller bearing at each end. The caps for the roller bearings and center bearings are carried by the upper half-crankcase, and are secured by studs and nuts. The caps are steel and of robust design.

The crankcase is an aluminum alloy casting, divided along the center line of the crankshaft. The upper portion is stiffened by three transverse webs, which also form the housings for the center bearings. Housings are also provided in the upper portion for carrying the camshaft bearings and the upper oil pump spindle bearings. Provision is also made for securing four bearers or supporting feet. Housings for the ball bearings carrying the timing gears are provided in the upper half and timing gear cover. On the front wall above the nose, a small casting is secured, which acts as an oil filler, and to which breather pipes are attached.

The lower half, beyond forming in itself a cap for the radial thrust bearing, merely acts as an oil sump and a cover for the moving parts.

The upper and lower portions are bolted together, the joint being effected by means of a brown paper gasket.

All the valves are operated by a single



The 85 h.p. Cirrus Mark III engine.

camshaft. It is supported in four bearings, the rear being a large ball bearing and the remainder phosphor bronze. The shaft is driven off the end of the crankshaft through the medium of steel gears supported, as already mentioned, between ball bearings housed in the top portion of crankcase and timing gear cover.

The induction manifold is of steel, with branches to each inlet valve port. A heated muff is provided in the central section, a pipe being taken from the exhaust manifold so that the exhaust gases can circulate therein. The joints between the induction manifold cylinder heads and carburetor are

made with "Hallite" gaskets.

The lower half of the crankcase will contain sufficient oil for about five hours' flight. The oil pump is arranged at the lowest part of the case, so that it is always flooded or self-primed with oil.

The oil pump, which is a gear type, forces the oil through a gauze filter, which is arranged horizontally just above the pump, thence through the main delivery pipe to the oil gallery arranged on the port side of the engine. The oil gallery is connected to passages cast in the top half of the crankcase, which run to the center and intermediate bearings; the oil is thus forced under pressure direct to each bearing.

Two spark plugs are fitted in each cylinder, placed at opposite sides of the combustion chamber. Two British Thomson-Houston high tension magnetos are used, which will be replaced by Scintilla magnetos on the American built engines.

The Claudel Hobson carburetor, which is used in England, will be replaced by an American carburetor of equal reputation.

## Specifications

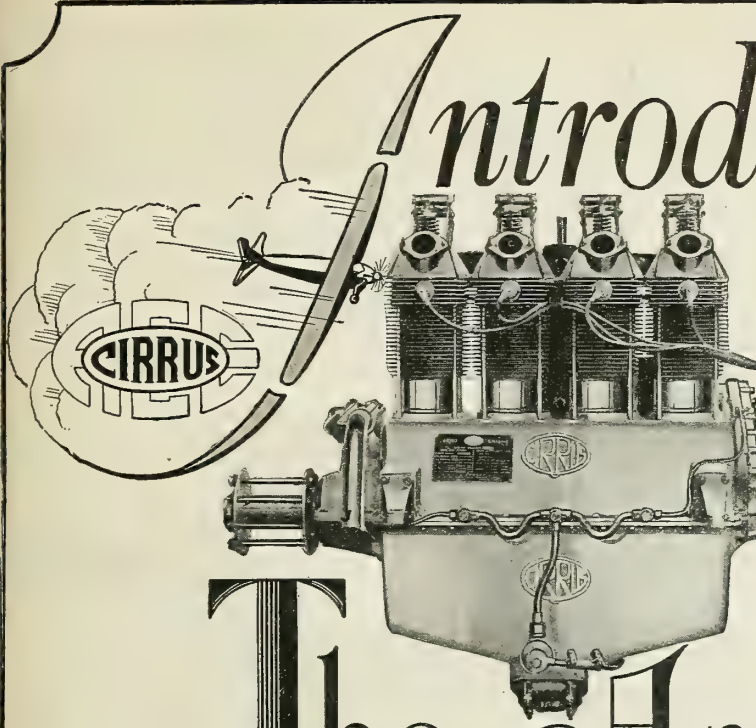
Bore .....	110 mm. (2.79 in.)
Stroke .....	130 mm. (3.30 in.)
Displacement ....	4,939 cc. (81 cubic inches)
Normal brake horsepower	85 at 1,900 r.p.m.
Maximum brake horsepower	95 at 2,100 r.p.m.
Direction of rotation .....	Clockwise
Ignition .....	Two magnetos
Tachometer .....	Half engine speed
Fuel consumption....	.54 pounds per hour
Oil consumption....	.0213 pounds per hour
Compression ratio.....	5.4 to 1
Weight of engine, dry .....	280 pounds
Length overall .....	1,161.5 mm. (29.5 in.)
Height overall .....	904 mm. (23.3 in.)
Width overall .....	482 mm. (12.25 in.)
Bearer centers .....	540 mm. (13.75 in.)

## MOBIL OIL AIRPLANE ENGINE OIL CHART

**T**HE Vacuum Oil Company has published the Gargoyle Mobiloil Chart for Airplane Engines. The chart lists the correct grade of Mobiloil for each American make of airplane engine. Thus, like the motorist, the airplane pilot now has an authentic guide to scientifically correct lubrication.

Mobiloil "D" is the summer and winter recommendation for all Curtiss models with the exception of OX, OXX and OX-5, for which the recommendation is "B" in summer and "A" in winter. Mobiloil "B" is the summer and winter recommendation for all the Wright engine models, and also for the Packard. Mobiloil "D" is the year round recommendation for the Pratt & Whitney engines.

The new airplane engine chart has been incorporated into the regular lubrication chart work of the Vacuum Oil Company engineers and, like the older automobile chart, will be revised, added to and re-issued from time to time.



# Introducing

The World's most famous four cylinder in line air cooled engine, holder of many international records.

# The American Cirrus Mark III

## IN PRODUCTION APRIL, 1929

So simple in design that it requires no greater skill for its maintenance than an ordinary automobile engine.

Built of the finest materials and so sturdily constructed as to outlive many engines in its power class.

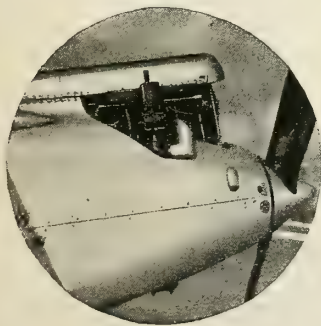
So perfect in workmanship that it can well be compared to a high-grade watch.

So reliable and astounding in performance as to warrant the statement that this engine made the light aeroplane of today possible.

Mounted in the nose of any light sport or commercial aircraft, it increases speed by reducing head resistance without obstructing forward visibility.

THESE ARE THE CHARACTERISTICS OF THE CIRRUS ENGINE, NOW BUILT AT OUR NEW PLANT IN BELLEVILLE, N. J.

Streamline cowling  
Avro-Avian



Write today for specifications and further literature

## AMERICAN CIRRUS ENGINES, INC.

WASHINGTON AVENUE, BELLEVILLE, N. J.



# VERVILLE AIR COACH

**T**HE Verville Air Coach is a new 4-place, semi-cantilever, cabin monoplane, recently produced and flight tested by the Verville Aircraft Company of Detroit, Mich. It embodies a number of original structural and design features: a new type of fuselage structure, eliminating the intersection of fuselage truss tubes in the plane of the side windows, and making possible an excellent range of visibility. Details of the fuselage trussing system will be forthcoming in a later issue. A patent on this system has already been applied for.

Two short streamline sponsons, or stubs, semi-elliptical in plan-form, and 16 inches in length, project horizontally from the lower longeron in the plane of the front spars. To these the forward wing brace struts and chassis Oleo struts are attached. By attaching the wing struts in this manner parasite resistance is reduced, as compared with the conventional type of exposed strut bracing. The landing gear shock struts are attached at the outer extremity of the stubs, allowing a seven-foot chassis wheel tread. The stubs also serve as small compartments, 8 inches deep, with hinged doors on their top side. The left compartment will be used for the lighting battery, and the other for tools.

A selective and service hand-brake control allows easy braking of either wheel alone, or the locking of both wheels. A tail wheel equipped with full castor Aerol shocks and built into the fuselage is provided.

Disc wheels, with faired hub caps, and fitted with 28x4 Goodrich tires, are used. The disc tail wheel, also employing an Oleo shock absorber, carries a 14x3 tire of the same make. The main wheels are fitted with Bendix brakes. Landing stress is distributed through tubular pyramid trussing between the two sponsons.

A detachable motor mount is provided and the ship can be fitted with the 5-cylinder, 150 h.p., Wright, giving it a high speed of 125 miles per hour—or the 7-cylinder, 225 h.p., Whirlwind, with the corresponding high speed of 140 miles per hour—or the 170 h.p., Curtiss Challenger engine.

The wings are attached to the fuselage

with trunnion type fittings. The wing struts are attached with screw terminals at the top, allowing dihedral adjustments from zero to 3 degrees. Wing tips are slightly curved and equipped with navigation lights. The wings are covered with Flightex and treated with pigmented dope.

Ailerons are of the Frise type and are operated by push and pull tubular controls. The aileron hinges are attached to triangular tubular supports, which in turn are attached to the rear spar and the four drag stations, making a total of four aileron hinger supports. All the control hinges throughout the

tanks are of welded aluminum and are elliptical in section.

The fuselage frame is built of chrome molybdenum tubing, and the truss is of the diagonal tubular brace type. Tail surfaces, as well as the ailerons are constructed of chrome molybdenum tubing. Rudder is stream-lined into the fuselage. Structurally the rudder is of the counter-balanced type. It is fastened to the vertical fin with two hinges equipped with oil-less bearings, the fin being of full cantilever construction. Elevators and stabilizers, on the Air Coach, are built in two parts, both front and rear



Cabin interior and tail arrangement of the Verville air coach.

ship are fitted either with bronze or oil-less bearings.

The wing struts are of streamline duralumin tubing, the after struts being attached to the lower longerons forward of the two side doors, and in line with the fuselage cross tubes to which the drag struts of the split type landing chassis are also attached. The wings employ double internal drag bracing, the internal drag struts being of steel tubing. The leading edge of the wing is covered with Alclad.

Two gasoline tanks, each of 25-gallon capacity, with Warner engine, and 35-gallon capacity with larger engines, are located in the wing on either side of the fuselage. The

spars of the stabilizer being fastened on two fuselage stub spars by means of two bolts. Right and left elevators, and right and left stabilizers are interchangeable.

The upper side of the fuselage is flush with the upper surface of the wings. Two diagonal truss members slant forward from fuselage front spar tube at an angle of 45 degrees, and inward to where they meet the forward fuselage frame members, forming a support as well for the windshield.

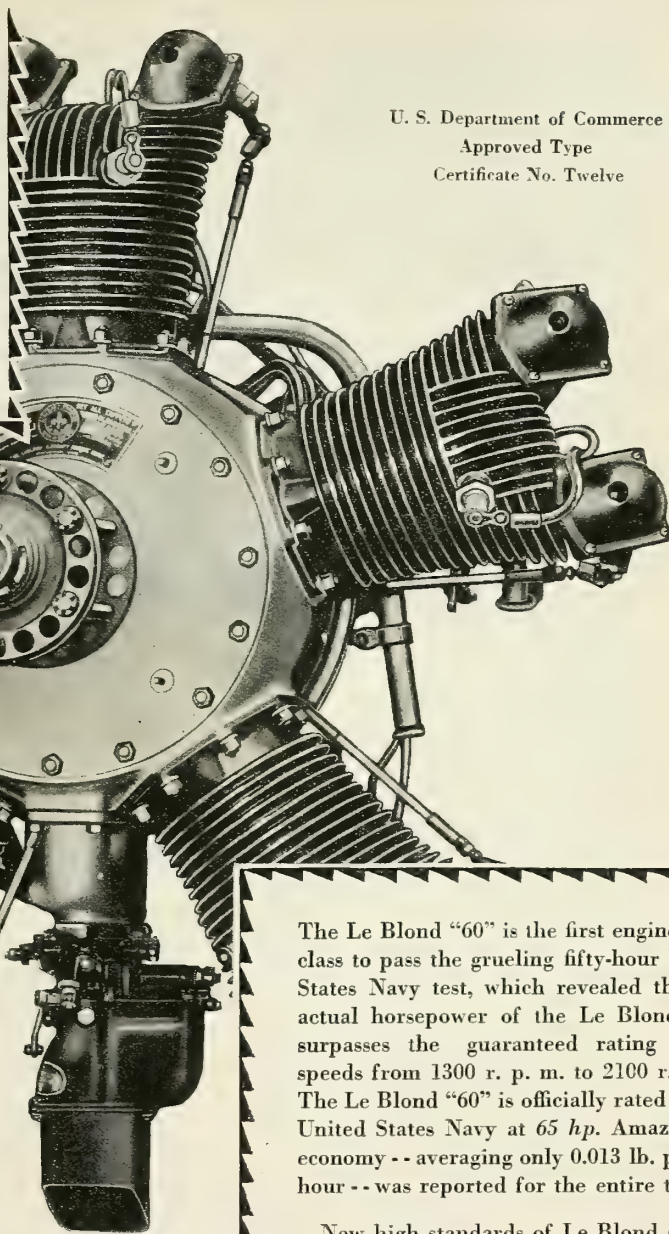
The carburetor is fed by gravity, and lubrication is derived from a 5-gallon oil tank, located in the fuselage forward of the cabin. Gasoline capacity gauges are suspended from

(Continued on next page)



Side view of the 4-place Warner engined Verville air coach which has a speed of 110 miles an hour.

*The* **LEBLOND** **60**  
**Tested...**  
*approved by*  
**U.S. NAVY**



U. S. Department of Commerce  
 Approved Type  
 Certificate No. Twelve

# LEBLOND AIRCRAFT ENGINES

The Le Blond "60" is the first engine in its class to pass the grueling fifty-hour United States Navy test, which revealed that the actual horsepower of the Le Blond "60" surpasses the guaranteed rating at all speeds from 1300 r. p. m. to 2100 r. p. m. The Le Blond "60" is officially rated by the United States Navy at 65 hp. Amazing oil economy -- averaging only 0.013 lb. per hp. hour -- was reported for the entire test.

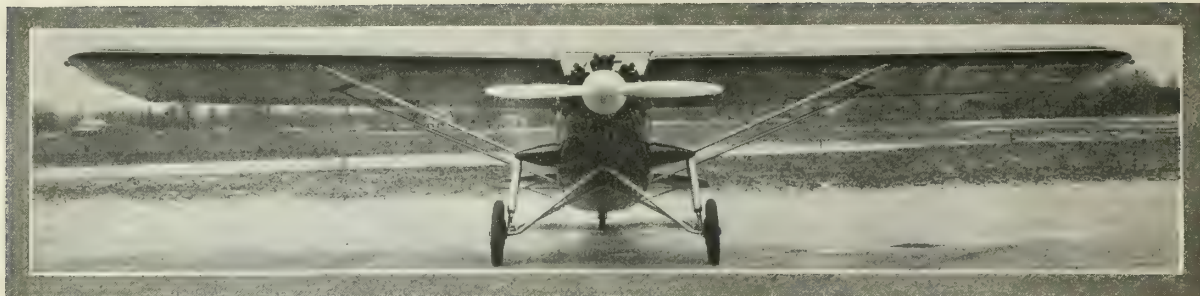
New high standards of Le Blond simplified unit design provide for lightning-fast assembly and disassembly, more power, and record low operation costs.

The low price and economy of operation of the Le Blond "60" make it at once available to training school, sport, light transport, and multimotor-ships.

Detailed information for those interested is available on request. Write today.

THE LE BLOND AIRCRAFT ENGINE CORP.  
 DEPT. D, CINCINNATI, OHIO, U. S. A.  
 California Distributor: C. C. Ludlow Co.  
 1227 Venice Blvd., Los Angeles, Cal.





Front view of the Verville air coach powered with a 5-cylinder Warner engine.

(Continued from preceding page)

the wing tanks on each side.

On the experimental plane no exhaust collector ring has been installed, although this, as well as a silencer, heater, and cabin ventilator, will be standard equipment on the cabin jobs, and the exhaust will be carried under the ship.

Stabilizer is adjustable, having a range of from 0 to 3 degrees, plus and minus. It may be adjusted from the cabin by means of a geared torque in the top, immediately over the left control wheel, and easily accessible to the pilot.

Just above the adjustment device, at a point where the top of the fuselage is approximately two feet wide, the Air Coach has a 24-inch by 10-inch handhole for inspection and adjustment of the tail wheel assembly, and the stabilizing adjustment assembly. The cover of the handhole is fitted with four Clinch fasteners. The entire tail wheel assembly may be removed through the bottom of the fuselage, simply by loosening two nuts. All masts and all control cables are concealed.

The cabin of the Air Coach, in size, lines and appointments, is closely analogous to the modern auto body. It has a maximum length of ten feet, two feet being used for storage purposes. Height of the cabin is four feet. Average width is 39 inches. Displacement capacity in the cabin is figured at 126 cubic feet. Control wheels are mounted on upright columns, designed to make possible either dual or single control. The control columns are of the torque drive shaft type, with a spline connection at their base. Either column may be disengaged by unscrewing a knurled nut.

Standard equipment on the dash includes a turn and bank indicator, climb indicator, compass, air speed indicator, oil pressure gauge, oil temperature gauge, altimeter, clock, instrument lights, and all light switches, and a Scintilla magneto switch. Except for the magneto switch, all of the plane's instruments are Pioneer, and nicely centered on a 27-inch by 9-inch crackle varnished dural board. The throttle is of the push and pull type.

Pittsburgh shatter-proof Duplate glass is used in the windows. The side windows slide back and forth. Two doors are located abreast of one another aft of the two rear seats, allowing easy ingress and egress. Two large skylights, fitted with green pyralin, are set in tandem in the cabin roof. Between these is the cabin's electric light. On the back wall of the cabin is a door, 18

inches by 12 inches in dimension, which is equipped with Clinch fasteners for inspection of the tail's interior.

The four seats in the cabin are bolted to the tubular structure of the fuselage. All upholstery is of Laidlaw's broadcloth, red below the belt-line, and gray above it, except for the seats, which are entirely red. A mat of woven automobile type is laid over the floor. There are four pockets, one on each door, and one on each side wall forward of the doors. Ternstedt hardware is used throughout the cabin.

#### Specifications

Engine.	Warner.	Whirlwind.
Wing span.....	40 feet	40 feet
Length overall.....	28 feet	28 feet
Height overall.....	7 feet	7 feet
Wing area.....	265 sq. ft.	265 sq. ft.
Aileron area.....	26 sq. ft.	27 sq. ft.
Rudder area.....	9 sq. ft.	9 sq. ft.
Elevator area.....	14 sq. ft.	14 sq. ft.
Stabilizer area.....	20 sq. ft.	20 sq. ft.
Fin area.....	4 sq. ft.	4 sq. ft.
Weight empty.....	1,525 pounds	1,750 pounds
Normal gross weight (loaded).....	2,400 pounds	2,900 pounds
Disposable load.....	875 pounds	1,150 pounds
High speed.....	110 m. p. h.	125 m. p. h.
Landing speed.....	45 m. p. h.	48 m. p. h.
Fuel capacity.....	50 gallons	70 gallons
Cruising range.....	600 miles	600 miles

## REPORTS ON NEW N. A. C. A. COWLING

ON February 13, the National Advisory Committee for Aeronautics released its second report on "Drag and Cooling with Various Forms of Cowling for a Whirlwind Radial Air-Cooled Engine." The first report, issued three months ago, dealt with the application of the N. A. C. A. cowling to single-engined airplanes, and the recent report deals with the application of the same principle of cowling to three-engined airplanes. It is a fact that the drag of the two extra engines and their housings uncowed is more than twice that of the engine and entire fuselage of a single-engined airplane, so that the N. A. C. A. cowling will have greater relative effect on three-engined airplanes than on a single-engined airplane.

This report gives the results of the second portion of an investigation in the twenty-foot propeller research tunnel of the National Advisory Committee for Aeronautics, on the cowling and cooling of a Whirlwind J-5 radial air-cooled engine. The first portion, which is reported in N. A. C. A. Technical

Report No. 313, pertains to tests with a cabin fuselage. This report covers tests with several forms of cowling, including conventional types, individual fairings behind the cylinders, individual hoods over the cylinders, and the new N. A. C. A. complete cowling, all on an open cockpit fuselage. Drag tests were also made with a conventional engine nacelle, and with a nacelle having the new complete cowling.

In the second part of the investigation, the results found in the first part were substantiated. It was also found that the reduction in drag with the complete cowling over that with conventional cowling is greater with the smaller bodies than with the cabin fuselage; in fact the gain in the case of the completely cowed nacelle is over twice that with the cabin fuselage. The individual fairings and hoods did not prove effective in reducing the drag.

The increased efficiency of three-engined airplanes as a result of using the N. A. C. A. cowling is indicated by the latest report to be from 20 to 25 per cent. The use of the N. A. C. A. cowling on such airplanes will not only permit higher operating speeds and better maintenance of schedules, but will also reduce the cost by decreasing the power required. Expressed in terms of performance, the reduction in drag effected by the N. A. C. A. cowling when applied to three-engined airplanes will mean either an increased speed of from 20 to 25 per cent or a saving in fuel of from 20 to 25 per cent, or an increase in the maximum range of the airplane of from 20 to 25 per cent.

Report No. 314 may be obtained upon request from the National Advisory Committee for Aeronautics, Washington, D. C.

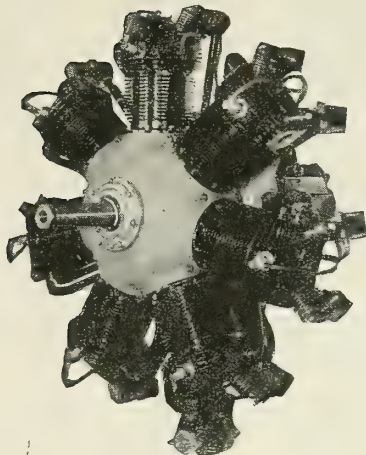
## NICKEL-IRON CASTINGS FOR AIR-COOLED CYLINDERS

RECENT developments in making cylinder castings from alloys of nickel, iron and steel, are enabling motor manufacturers to decrease greatly the cost of their air-cooled motors. These developments were the result of research work carried out by S. Cheney & Son, of Manlius, N. Y., in collaboration with one of the largest manufacturers of air-cooled motors.

The research work followed nearly twenty-five years' experience in casting air-cooled cylinders, and the resulting alloys have been in commercial production for nearly four years. These alloys have remarkably even grain and exceptional wearing qualities.



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U. S. A.



# CURTISS-REID RAMBLER

**T**HE Curtiss Aeroplane Export Corporation of Garden City, N. Y., has entered into an arrangement with the Curtiss-Reid Aircraft Co., of Montreal, Canada, to handle its foreign sales. The Curtiss-Reid Aircraft Co. manufactures the Curtiss-Reid Rambler, a light two-place biplane, powered with the air-cooled Cirrus Mark II engine, in which the cylinders are arranged in line.

The Rambler has been especially designed for the use of flying clubs, training schools, private owners, forest patrol and transportation companies, where economical transportation of single passengers or an equivalent weight of freight is required. In accordance with these requirements, simplicity of construction, ease of maintenance, low depreciation, small hangar space, etc., have been carefully studied.

The machine is a tractor folding biplane of sesqui plane type, having the upper wing of considerably greater area than the lower. The smaller lower wing allows an extremely wide field of view, both for pilot and passenger.

The construction of the machine is of metal throughout, with the exception of the wing and fuselage covering, which is of the highest grade Irish linen fabric.

The fuselage is of seamless steel tubing welded into a solid unit. There are no bracing wires requiring adjustment, and, in the event of accidental damage, repairs can readily be made.

Wing spars and ribs are made of aluminum alloy. Ribs are one-piece pressings,

and all interplane bracing is tubular, requiring no adjustment. The interplane bracing is of streamline seamless steel tubing requiring no rigging.

The tail plane, elevators and rudder are of seamless steel tubing. The tail plane is a single unit, while the twin elevators are bolted together at the center of the machine where the control cables are attached. The tail plane is supported from the fuselage by two streamline steel struts on each side, eliminating all tendency to flutter.

A special type of undercarriage having a wheel tread of 6 feet is fitted. The landing shocks are taken on a special form of rubber buffer, consisting of approximately streamline form, which is compressed under landing loads. The tail skid is of simple construction and has a shoe readily renewable in event of wear. Skis, interchangeable with the wheel, can be supplied for winter flying.

Twin metal floats and float undercarriage can be supplied and are of the most modern design, insuring quick get-off under all conditions.

The gas supply is by gravity from a twenty-gallon tank in the top centre section plane. All oil is carried in the engine base.

Complete dual control is installed, and an adjustable spring is fitted to the elevator controls to trim the machine fore and aft under all conditions of flight.

Positive action bolts are fitted to the front spars of both top and bottom wings, and folding can be carried out by two peo-

ple in two minutes. When folded, the smaller chord of the lower plane permits easy access to the rear of the machine when housed in a small hangar.

Comfortable seats of the parachute type are fitted. Deep cushions, readily removable, are supplied and by removing these the seats are available for use with parachutes without change of height.

The following Consolidated instruments are fitted: airspeed meter, revolution indicator, altimeter, oil pressure gauge, inclinometer and compass.

A commodious baggage compartment is fitted behind the rear seat.

Safety belt, fire extinguisher, kit tools and tall skid maneuvering handle are supplied.

## Dimensions

Length overall, open	.....22 feet 8 inches
Length overall, folded	.....24 feet 6 inches
Span, opened	.....33 feet
Span, folded	.....11 feet 1 inch
Height	.....8 feet

## Weights

Weight, empty	..... 830 pounds
Gas, 20 gallons	..... 145 pounds
Oil, 1 gallon	..... 10 pounds
Pilot	..... 180 pounds
Passenger	..... 180 pounds
Baggage	..... 80 pounds
Total weight loaded	.....1,445 pounds

## Performance

High speed	..... 105 miles per hour
Cruising speed	..... 85-90 miles per hour
Stalling speed	..... 38 miles per hour
Service ceiling	..... 16,000 feet
Rate of Climb	..... 800 feet per minute

## Strength Factors

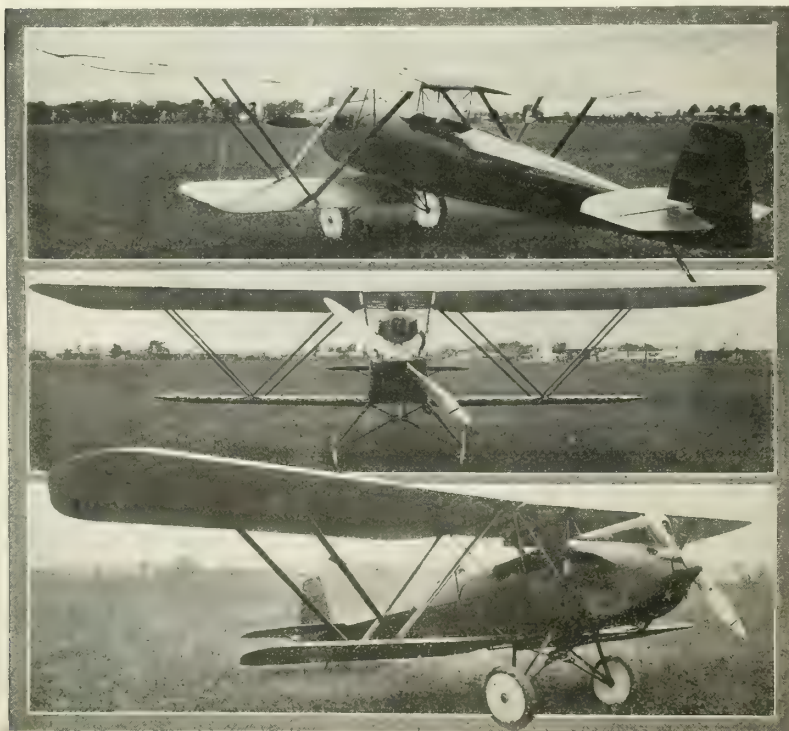
At an all-up weight of 1,440 pounds, the machine has full acrobatic factors as laid down by the International Commission for Air Navigation (I. C. A. N.) These factors are:-

High incidence	..... 9.0
Low incidence	..... 6.75
Inverted flight	..... 4.5
Terminal nose dive	..... 2.5
Landing	..... 6.0

The machine can also be flown under I. C. A. N. factors for commercial aircraft at an all-up weight of 1,650 pounds, but no acrobatics may then be performed. A certificate of airworthiness issued by the Director of Civil Aviation, Ottawa, is supplied with every machine.

## THE OXWELD SHAPE CUTTING MACHINE

**A**N automatic oxy-acetylene shape-cutting machine designed to cut shapes of any sort from steel plate, sheet, forgings, billets or ingots has been introduced by The Linde Air Products Company of New York. In this machine the cutting blowpipe is mounted on a carriage which is moved in any direction by means of an electric motor. For routine production it will operate automatically from templates. In cases where only a few parts are to be cut out, a hand tracing device can be attached and used to follow the outline of a sketch or blueprint.



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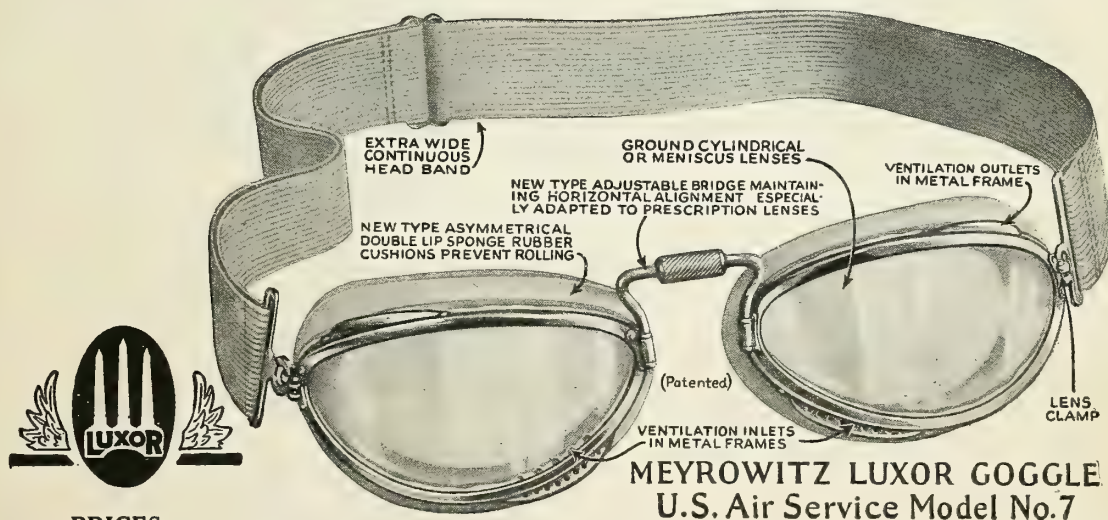
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# COMTE "GENTLEMAN" A. C. 4

**T**HE Comte "Gentleman," a high-wing monoplane powered with ADC Cirrus Mark III engine of 85 horsepower, is built by the Alfred Comte Company of Zurich, Switzerland.

The "Gentleman" is best suited for air-touring and training purposes. Its appearance is clean and pleasing. Adequate protection from draft, rain and exhaust fumes is provided in the structure of the cabin. The seats are placed side by side with ample room for elbows as well as for feet. According to the claims of the builder, the plane will keep straight on its course flying hands off. The actions of the controls are very quick and positive. When stalled, it is said that the plane settles slowly on an even keel; it does not drop off on a wing or spin.

Two seats are arranged side by side in a roomy cabin. Triplex safety glass gives excellent protection and good vision. A table extending across the fuselage ahead of the instrument panel is conveniently arranged to lay out maps and other things used on cross-country flights. Easy access to the cabin is attained by a door and steps on the right-hand side of the fuselage. In the back of the cabin there is a large room for luggage. A door on the left side of the fuselage gives admission to this compartment. A folding seat makes it possible to accommodate a second passenger instead of luggage.

The fuselage is built of steel tubing, joined by welding and covered with linen. The front part is braced with diagonal steel tubes, the rear part with steel wires.

The wing is built in two panels hinged to the top of the fuselage and braced on each side by two steel tube struts. Box beams and three-ply spruce strips of the Warren truss type form the wing structure, which is internally braced with steel wires and tubes.

Control surfaces are of steel tubes welded together and covered, like the fuselage and the wing, with linen.

The engine is supported on two ash bearings which effectively dampen vibrations. Special quickly detachable safety clips make it possible to uncowl the engine completely in less than a minute. The gasoline tank is placed above the fuselage between the wings. Feed is by gravity. No oil tank is needed, for the engine contains sufficient oil for six hours.

The landing gear is of well-proved design, with long travel shock absorbing struts in

front. Connections to the fuselage are by ball joints.

A wooden propeller with metal protected tips is standard equipment.

The structural strength of the plane complies with the highest requirements for commercial aircraft. Load factors are: 7.5 for high incidence condition, 4.5 for low incidence, and 3 for inverted flight. In the nose dive condition there is a safety factor of 2 at a speed of 140 miles per hour.

## Specifications and Performances

Wing span.....39 feet 9 inches  
Length.....26 feet 7 inches  
Height.....9 feet 3 inches

Wing area.....210 square feet  
Weight empty .....1,030 pounds  
Fuel (5 hours).....176 pounds  
Weight of oil.....10 pounds  
Gross weight loaded.....1,580 pounds  
Wing loading.....7.5 pounds per square foot  
Power loading.....18.7 pounds per h. p.  
Maximum speed.....100 miles per hour  
Minimum speed.....42 miles per hour  
Cruising speed.....80 miles per hour  
Fuel consumption (cruising) 17 miles per gal  
Rate of Climb.....600 feet per minute  
Time to climb to 1,000 meters...6 minutes  
Ceiling.....14,000 feet  
Cruising range.....430 miles

## CABIN AIRPLANE INSULATION

By Gale Pearce, Chief Engineer, Dry-Zero Corp.

**M**UCH experimental work has been done to determine the best method of insulating the walls of cabin planes to reduce noise and provide warmth for passengers at the low temperatures encountered at high altitudes. Several airplane manufacturers tried out a number of mediums proposed for sound deadening and insulating purposes, and the Bureau of Standards sought to determine which of the various suggested materials were most suitable for airplane cabin insulation.

These investigations showed that the greatest effectiveness of sound deadening is obtained when the insulating material is installed as loosely as possible between inner and outer walls, and attached at intervals to the exterior wall mechanically or by adhesion. The sound deadening effect is largely dependent on the resilience of the medium used, for the vibrations of the exterior wall are reduced or damped by the energy being taken up in the resilient insulating medium. If this medium is packed tightly between the two walls, the vibrations will be carried to the inner wall, with the result that the sound will not be effectively reduced. A 2-inch thickness of insulation properly installed reduces the noises of the engine to such an extent that passengers in the cabin may converse comfortably in a normal tone of voice.

From a heat insulation standpoint, with a given material, the maximum thickness of insulation will, of course, give the maxi-

mum effectiveness in retaining the heat in the cabin. An insulation wall from 1½ inches to 2½ inches is sufficient, however, to give satisfactory results in maintaining a comfortable degree of temperature in the cabin.

The primary requirement of a material for this purpose is light weight, and unless the sound deadening effect and insulation against the loss of heat from the inside of the plane are secured, the efforts are in vain.

In these tests, hair felt, cane fibre-board, wood fibre-board and blanket, Dry-Zero blanket, and many other materials were tried out. The Dry-Zero Blanket which weighs but one-fifth of a pound per square foot in the two-inch thickness, is non-hydroscopic, and because of the fineness and resilience of the ceiba fibres which make up the insulation and sound deadening wall, very effective results are secured.

## "MAGNESIUM AND ITS ALLOYS" BY DOW CO.

**"M**AGNESIUM and its Alloys" is a booklet published by the Dow Chemical Company of Midland, Michigan, to educate the public in the qualities of magnesium alloys, of which it is a manufacturer.

Taking up the manufacturing of magnesium from the base, magnesium chloride, the physical properties of the pure metal are given. The qualities of the various alloys are compared, and from this comparison are deduced the uses of each alloy. The physical structures of the alloys receive brief notice, but the processes that are used in forming the alloys into usable objects in the Dow factory are more thoroughly given, as well as some of the explicit uses of the alloys.

The book is supplemented by a paper, "The Treatment and Structure of Magnesium Alloys," by John A. Gann, metallurgist for the Dow Company, which was presented before American Institute of Mining and Metallurgical Engineers in October, 1928. This paper treats the technical side of its subject thoroughly.



The Comte "Gentleman," a two-place cabin plane built in Switzerland.



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Space does not permit us to describe all of these books in this announcement but those included will give you an idea of the wide range of subjects covered—we shall be pleased to send you information regarding the other books of the series upon request.

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This book is based on the author's sixteen years' experience in the design, construction, testing, and operation of seaplanes, and on data obtained from other leading authorities both in America and Europe. Aircraft float design requires the combination of the arts of naval architecture and of aero-architecture to produce floats that will be both seaworthy and airworthy; in many respects these demands are conflicting. Floats to be successful must be designed with a recognition of the influence and importance of the various factors based on the constant checking of results in actual operation. Captain Richardson's new book gives the designer and student a great fund of information never before obtainable. In considerable detail he reviews the effects of different shapes and combinations—even to include the record of some failures, where these disclose little known or novel phenomena of importance. The subject of design is treated from the viewpoint of form arrangement and proportion, and is carried into the determination of performance. Considerations affecting loading conditions are pointed out, and the importance and use of model tests shown.

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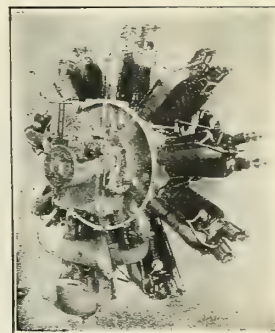
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# on Aeronautics

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### Elements of Aviation

by Colonel V. E. Clark, formerly Chief Aeronautical Engineer, U. S. Army. 193 pages, 24 illustrations, Price \$3.00

This new book by one of the world's leading airplane designers, who originated the airfoils used in most successful planes in both America and Europe, will give you a clear understanding of the fundamental reasons why an airplane flies, why it is stable or unstable, controllable or uncontrollable in various attitudes and conditions—in short, "why an airplane does what it does." Its explanations are simple, but absolutely authentic, no matter how far you may advance in aviation you won't have to learn anything that this book tells you.

It will help the beginner learn more rapidly and to become a better and safer pilot. The veteran flyer will find in its pages an explanation of many questions regarding the behavior of a plane that may have bothered him. The flying instructor will find here simple but thorough answers to many of the puzzling questions that his students ask him.

### Aircraft Instruments

by Herbert N. Eaton and other engineers of the Aeronautic Instruments Section, United States Bureau of Standards. 269 pages, 68 illustrations, Price \$5.00

Describes more than 175 types and makes of aircraft instruments. Gives not merely mechanical explanation of each instrument but also a summary of the principles upon which it operates and, wherever possible, opinions as to its advantages or disadvantages. Among the instruments described are altitude, attitude, air-speed, and engine revolution indicators; oil and radiator thermometers, gasoline gauges, earth inductor compass, sextants, banking indicators, etc., etc. Provides practical information on installation and maintenance of instruments which will prove particularly helpful to airplane mechanics.

### Airmen and Aircraft

#### An Introduction to Aeronautics

by Major Henry H. Arnold, Air Corps, U. S. Army. 218 pages, 24 illustrations, Price \$3.50

Fascinating, practical and authentic information for everyone interested in any branch of aviation. Describes in detail the instruction given at the Army's Primary and Advanced Flying Schools, including the subjects taught, the number of hours devoted to each, educational and other requirements for entrance to government courses, pay and allowances, etc. Outlines the history of aeronautics, including both lighter- and heavier-than-air craft, changes in designs, stories of famous fliers and their flights, definitions of aeronautic terms, points out opportunities in commercial aviation, etc., etc. If you are considering taking a course in any branch of aviation you should read this book before you decide—it will show you just what you should receive for your money and may save you from serious financial loss.

### Building and Flying Model Aircraft

by Paul E. Garber, U. S. Nat'l Museum, Smithsonian Institution. 300 pages, 198 illustrations, Price \$2.25\*

A complete course in model building in progressive lessons. Describes in detail every step in the construction of 15 models and contains data on 16 others from which planes may be made. Among the aircraft described are models for indoor and outdoor flying, including tractor and pusher airplanes and seaplanes, scale models for exhibition purposes, gliders and balloons; included are accessories such as winders, carrying boxes, repair kits, etc. Also tells how to make propeller and other wooden parts, metal fittings, compressed air engines and best way to attach paper and cloth wing coverings, gives complete lists of all the materials and tools needed, etc., etc.

\*This book can be obtained at most bookstores; on mail orders 20 cents is added to cover shipping charges.

### Aeronautical Meteorology

by Willis Ray Gregg, Meteorologist in Charge of Aerological Investigations, U. S. Weather Bureau. 144 pages, 49 illustrations, Price \$2.50

This book furnishes you with the kind of information needed to understand weather maps at a glance and to use local observations for immediate forecasts of weather probabilities with their application to prospective flying conditions that are likely to be encountered.

Among the subjects included in this book are: weather forecasting from clouds; the average height of clouds of each class; the variation in direction and velocity of winds with change of altitude; the frequency of winds from each direction at various altitudes; the characteristics and dimensions of thunderstorms; general circulation of the atmosphere; visibility; instruments and methods of observation; cyclones and anti-cyclones, etc.

### Engineering Aerodynamics

by Lieut. Walter S. Diehl, (C. C.), U. S. N.; Scientific Section Bureau of Aeronautics; Member of Aerodynamic Sub-Committee, N. A. C. A. 288 pages, 159 illustrations, Price \$7.00

Practical information on aerodynamics, presented in forms suitable for direct application by aircraft designers and advanced students of aeronautical engineering. Large amount of data is condensed in working diagrams and equations, many important calculations are illustrated by practical examples. Shows how modern theories of life and drag are applied in everyday design problems. Gives methods for designing control surfaces; explains advantages and limitations of airplane model tests and shows how data are interpreted. Gives detailed methods for calculating and estimating performance; shows how performance tests are made and how the observed data are reduced to standard conditions, etc., etc. About two-thirds of the material this book contains has never before been available in printed form.

### Airports and Airways

by Lieutenant Donald Duke, Chief, Airways Section, Army Air Corps. 178 pages, 68 illustrations, Price \$5.00

A careful study of this volume will assure proper procedure and prevent costly mistakes in the handling of any city's air traffic problems. Shows how to select a site for an airport, considering such factors as drainage, prevailing winds, accessibility, surface transportation, etc. Illustrates points with aerial photographs, charts, and tables of practical value. Information on types of mooring towers, hangars, buildings, and additional equipment needed, together with construction cost data—all made available in a practical manner adaptable to any size airport. Methods employed by aviation committees and chambers of commerce to stimulate interest and increase the volume of commercial air traffic are given for the first time.

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# THE AIR SERVICES

## NAVAL FLIGHT TESTS

**G**REATER accuracy attained in the study of airplanes while climbing has already shown the wisdom of establishing the flight test sections of the naval air station at Anacostia.

A more exact method of determining climb characteristics has been found. By means of this method, advanced by Lieut. W. S. Diehl, the performance of aircraft in climb may be fairly compared in spite of the difference in atmospheric conditions found in summer and winter. Also, the reduced time and rate-of-climb curves follow more closely the actual performance instead of indicating a higher time and rate at intermediate altitudes, as is often the case when the rate of climb is assumed to bear a linear relation to altitude.

Since the flight-test sections were established 18 months ago, tests have been conducted on thirty airplanes, eight of which were fitted as amphibians. Accessory tests numbered 106, among which were nineteen conducted on engines, nine on controls, nine on fuel systems, eight on propellers, eight on landing gears, eight on water and oil cooling systems, six on instruments, four on ordnance, and four on radio.

## MORE NAVY PILOTS NEEDED

**W**ITH only half enough commissioned pilots to fly the planes which will be built for the Navy in 1933, the Hon. Edward P. Warner, Assistant Secretary of the Navy for Aeronautics, pointed out to the House Appropriations Navy Sub-Committee the necessity of obtaining pilots for the Navy. He asserted that he did not believe enough fliers could be obtained in the regular way from the ranks or from the Naval Academy.

The Navy has at present only 469 commissioned pilots, and in 1933 it will need eight hundred pilots. Captain King at the hearing outlined the plan of training enlisted pilots so as to relieve the strain on the Pensacola Training Station.

## LARGEST ARMY AIR CLASS GRADUATED

**K**ELLY FIELD graduated the largest class in the advanced flying school since the war on February 28, when eighty-two cadets and four Army officers received their wings. These graduates attended a full year's course of intensive training to gain the rank of airplane pilot, eight months of which was spent at preliminary schools.

## NAVAL RESERVES AT ROCKAWAY ACTIVE

**D**EFINITE plans for increased activity of officers and personnel are being drawn up by the officers of the Naval Air Base at Rockaway Beach, Long Island, New York. Two separate squadrons meet regularly every week for drill and instruction. In addition to the regular periods of drill and study, there are athletics; a new basketball and handball court has just been completed and in the spring there will probably be a baseball team.

Group flying for both squadrons is carried on over the week-ends. Quarters are available.

Lieut. Julian Moebus, commanding officer, and Lieut. C. S. Wildman, executive officer, have planned to give every officer and enlisted man a maximum number of hours in the air during the coming spring and summer. All equipment is being thoroughly overhauled and put in first class flying condition.

## AIR TRAINING FOR WEST POINT CADETS

**T**ENTATIVE plans of the Air Corps contemplate the use of five primary training planes with ten instructors from the Air Corps Training Center, Duncan Field, Texas, for the purpose of giving 250 Cadets of the United States Military Academy training at Langley Field, Va., from June 17 to July 3, 1929, inclusive. It is proposed to give each cadet three hours of aerial instruction.

## NON-RIGID TA-5 APPROVED

**A**FTER extended tests at Scott Field, Belleville, Ill., the War Department has approved the non-rigid TA-5 type airship as standard for manufacture for the Army Air Corps. The TA-2 type becomes limited standard and will no longer be manufactured.

The TA-5 type is 150 feet long, has a gas capacity of 130,000 cubic feet, and is powered with two engines. It carries five passengers and is equipped with dual controls.

## THE ASIATIC MAN-EUVERS

**T**HE Asiatic Airplane Squadrons, in their annual maneuvers off the Asiatic coast, found the rapidly changing wind of that region difficult to overcome in their bombing practice. The wind in every attempt changed in velocity from six to eight knots between the aiming and the dropping of the bomb. The operations of the squadrons have included camera gun and bombing practice.

The Olongapo and Cavite Navy Yards have aided the squadrons greatly in the repair of planes and pontoons. The service and equipment of these yards has received most favorable comment from the Bureau of Aeronautics.

## NAVAL AIRSHIP BASE ON COAST

**S**HEDED facilities involving a \$5,000,000 naval airship base on the Pacific Coast have been proposed by the Navy Department. An initial appropriation of \$2,000,000 will be required to start the work.

The completion of two giant dirigibles, contracts for which were let last October, will require more shed room. If the proposed base is not built, the contract for one of the dirigibles might have to be cancelled. The bill proposed a board of naval officers to examine the West Coast for a suitable location for the base, and to submit a report to Congress.

## THIRD ATTACK WING AT SHREVEPORT

**S**HREVEPORT, LOUISIANA, is the new home of the Third Attack Wing of the Air Corps of the U. S. Army. The Wing will have a landing field and bombing range eight miles long and four and one-half miles wide on the north of the city.

**M**AJOR General James E. Fechet, chief of the Army Air Corps, in his annual statement, announced that 3,833 applicants for air training were received by the Army during the fiscal year, but only 506 qualified for training.



Photo by R. K. Clark

March Field basketball team and the Fokker used to carry them to out-of-town games.

# AGAIN LOCKHEED



## *Breaks the Record!*

**F**LYING from west to east at a time when weather conditions are most adverse...through driving rain, snow, sleet and blinding fog, weather that forced many planes to land and prevented others from taking off...lifting a gross load of three tons and at times reaching a ceiling of 15,000 feet, the Lockheed Air Express under the skillful control of Captain Frank Hawks, who with Oscar Grubb, mechanic, established a new transcontinental non-stop record, flying from Los Angeles to New York in 18 hours, 21 minutes and 59 seconds. This eclipses the former record made with Lockheed under favorable conditions, by 37 minutes!

The purpose of this flight was not to set a record! Its underlying objective was to prove to the American public that a pilot of ability and a sturdy, dependable plane form a combination that conquers all hazards encountered in flight. It was to establish this fact that the flight was purposely made at a time when weather conditions were known to be most unfavorable.

*That the Air Express has so completely demonstrated its overshadowing dependability, stands as a glowing tribute to air mail pilots and operators who have so closely cooperated with Lockheed engineers in the development of this plane.*

The Air Express is the result of more than two years' effort. It is designed to carry mail and passengers at high speeds over great distances in *absolute safety* and utmost comfort. It represents the most modern development in single motored payload aircraft. Complete information and specifications will be furnished operators on request.

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# WESTERN NEWS

## CONTACTS

By F. E. SAMUELS

MUCH of the success of the perfect functioning of the 60 horsepower LeBlond motor used in the Golden Eagle biplane by Bobby Trout in her recent record endurance flight, is due to the forced oil feed system to the rocker-arms, which was installed by the Miller Airplane Products of Los Angeles. On the flight of January 2nd, of the same ship and motor, the bearings of most of the rocker-arms were burnt out, due to the lack of lubrication. Mr. Bone, builder of the Golden Eagle, and Leslie Miller, of Miller Airplane Products, got together and an arrangement was made by which Miller guaranteed a good lubrication for as long as the plane stayed in the air. Miller installed a very small copper tube to each rocker-arm. These were all connected to a larger copper tube, which was run to and through the floor board of the cockpit. At the terminal of this tube, within easy reach of the pilot, was connected an Alemite lubrication gun which was filled with heavy Rich-lube oil. At intervals during the flight, Bobby gave the gun a half turn which forced the heavy oil to each of the rocker-arms, giving them all lubrication. When inspected after the flight, the bearings of the rocker-arms were found in perfect condition.

THE Western College of Aeronautics may be congratulated for the wonderful progress it has made since the first of the year. Fifty new students were enrolled during the month of January. This sets a high mark for monthly enrollments. There

are now sixty-one members taking flying instructions and ninety in the ground school course. Colonel R. S. Hartz, instructor of the ground school, announces the extension of the course to include instructions in light sheetmetal work.

CAPTAIN WILKINSON, head of the Universal Institute of Aeronautics of Los Angeles, announces that plans for the opening of a school of aviation in all branches of commercial flying have been practically completed with the signing of a lease for a field. The property acquired is a large tract lying west of the new Avelon Boulevard, south of 190th St. Short's flying field, which adjoins the newly acquired site, also is reported to have been leased by the new school, which will be run in connection with the present Universal Institute of Aeronautics.

THE Crawford Aeronautical School of Venice, Calif., has all the indications of being one of the leaders in its line in Southern California. A large, complete building at Venice has been leased and is being remodelled to meet requirements of a ground school. An additional building connected with the main building, which will be used for class rooms, has just been completed. The main building has been laid out to accommodate classes in the different branches of aeronautics to be taught, and a most complete equipment of engines, planes, and parts, with machinery for wood, fabric and metal work has been installed. Harry Crawford, of the Crawford Airplane Company, has looked after the equipment instal-

lation and should know what is required.

Flying instructions will be given at Clover Field, Santa Monica, under capable instructors. The branches of instruction to be taught at the ground school include theory of flight, structure and rigging, airplane engine course, and airplane mechanics.

A NEAT and pretentious aircraft supply store is being conducted by the Wheeler-Hahn Company of Los Angeles, where a complete stock of all aeronautical supplies used by manufacturers, the aircraft dealer and the aviator may be secured. Mr.

Wheeler is a boyhood friend of both Mr. Nicholas and Mr. Beazley and is now handling many of their products. The firm extends a welcome, not only to the aviation trade, but also to the public to visit this well equipped store.

AN invitation to the regular monthly meeting of the Professional Pilots Association, at the Polyanna Tea Rooms, February 12th, I accepted as usual, and to say that I spent a pleasant evening is putting it mildly. A nice dinner was followed by the regular business session, which in turn was followed by interesting and instructive talks by some of the leaders of the industry. Tommy Thomas, president of the association, presided and Maury Graham, that prince of good fellows and pilot of the Western Air Express, introduced the speakers. Mr. W. P. Balderston, head of the Pacific Scientific Instrument Company, with the aid of lantern slides, described the working of different navigation instruments used on transport and air mail planes.

THE new Los Angeles Metropolitan Airport is now the California headquarters for the Rankin System of Flying Instructions, according to Paul L. Burkhard, manager of Associated Airways, California licensee of the Rankin System and state distributor for American Eagle airplanes. Associated Airways has transferred the major part of its operations and flying school to the Metropolitan Airport.

THE California Aerial Transport is presenting a course of instruction in practical flying that is worthy of consideration by anyone desirous of procuring a pilot's license.

One of the outstanding features is the guarantee that every student who completes the course will be able to qualify for a pilot's license. If a student has not gained sufficient experience to enable him to qualify for a pilot's license after a specified time, his instruction is continued until he does receive a pilot's license.

The California Aerial Transport assumes all responsibility for any damages that might occur to planes while being used by the students.

## CALIFORNIA AIR NEWS

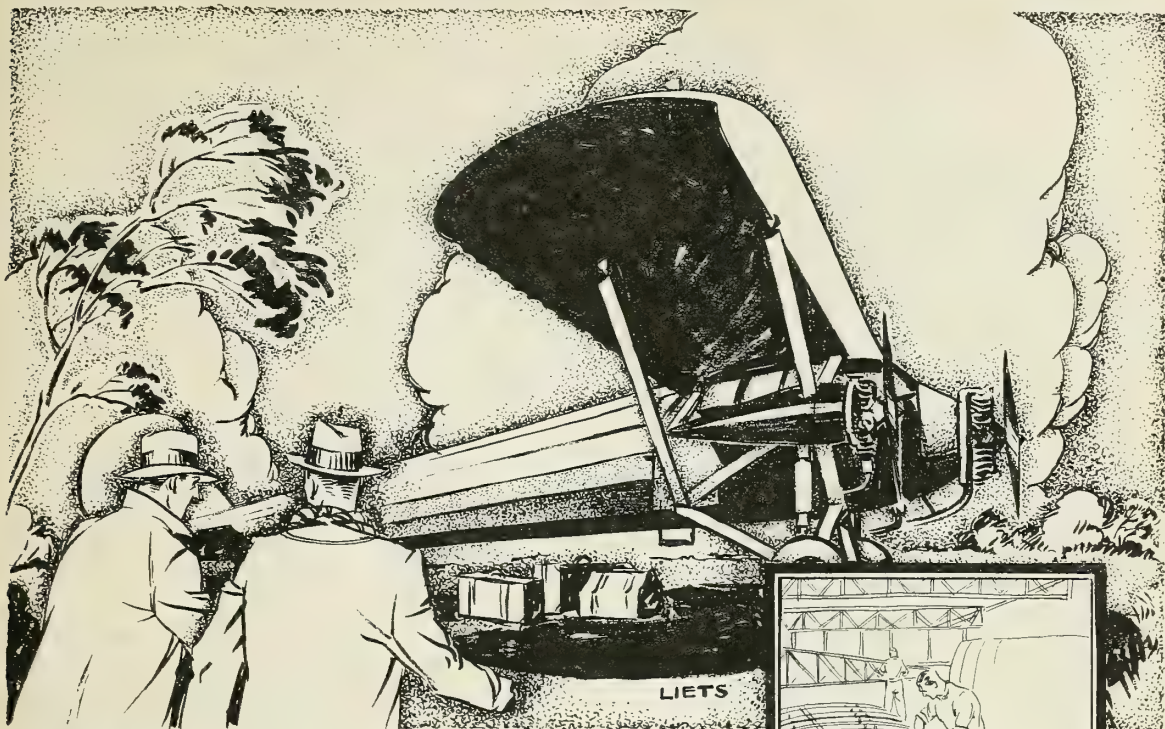
### Pilots Protest State Regulation

THE Pilots and Operators Association of Northern California has joined in the statewide campaign in opposition to the proposed California legislation providing for regulatory control over the aircraft industry by the State Motor Vehicle Department. Hundreds of pilots and operators identified with commercial aviation in this state have enlisted in the campaign to oppose passage of the measure at the coming session of the State Legislature.

(Continued on next page)



Lockheed Company officials with Hawks at the start of the transcontinental flight. Left to right, Allen H. Lockheed, Capt. Hawks, of the Texas Oil Co., Glenn Hunter and Fred E. Keeler.



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(California Air News continued)

The association has appointed the following delegation to appear against the measure in the state legislature: Robert Martland, H. A. Reed, Hugh Shippey, W. F. Herron, Leland Peoples, and Nelson Jenkins.

**TRAINING** three hundred flying students at a time is the plan of the Curtiss Flying Service in establishing an advanced flying school at the Los Angeles Municipal Airport. The company has obtained a ten-year lease on five acres of Mines Field, and will invest fifty thousand dollars in a hangar and equipment during the present year. The ultimate investment will be \$150,000 according to C. S. (Casey) Jones, president of the Curtiss Flying Service.

Major C. C. Moseley resigned as vice president of the Western Air Express to become president of the subsidiary California Curtiss Flying Service.

#### New Kinner Plant

**THE** Kinner Airplane & Motor Corporation is now operating in its new plant at Glendale. The new plant, including test houses, covers approximately two and one-half acres, and is completely equipped with modern machinery.

The company is concentrating on the production of the 5-cylinder radial engine rated at 100 horsepower at 1,800 revolutions per minute.

Motors are now being produced and shipped at the rate of thirty per month, and the indications are that production will exceed sixty motors per month by the end of March.

Mr. N. N. Tilley, formerly Civilian Chief Engineer at McCook Field, Dayton, Ohio, has become chief engineer of Kinner Airplane & Motor Corp.



The new plant of the Kinner Airplane and Motor Corp. at Glendale.

**GEORGE M. HOLLEY** of Detroit, Mich., recently acquired a substantial interest in the Kinner Airplane and Motor Corp., of Glendale, and has been elected to the board of directors. Mr. Holley is president of the Holley Carburetor Company, president of the Towle Marine Airplane Company, and a director of the Stinson Aircraft Company, all of Detroit.

**THE** War Department recently awarded a parachute manufacturing contract to the Russell Parachute Company of San Diego.

This concern secured the exclusive contract for the fabrication of all standard

Army type parachutes to be delivered to Army Air Corps units during the fiscal year 1929-30. Two tons of silk, 500,000 feet of silk cord, 25,000 feet of webbing, 200 pounds of silk thread, and more than 1,500 yards of duck will be required for the army parachutes.

#### Standard Airlines Extended

**THE** Standard Airlines, Inc., has made an arrangement with the Texas and Pacific Railway which will enable passengers using its planes to El Paso to continue to eastern and northern cities without delay. The new service was inaugurated February 4th.

Under this arrangement, the service between Los Angeles and El Paso will be by air and connections will be made at the latter point with regularly scheduled trains. Sixteen hours will be saved between Los Angeles and cities east of El Paso through this new system.

The Standard Airlines, Inc., has added a fleet of Fokker cabin planes to its present equipment and will operate a daily service each way between Los Angeles and El Paso with stops at Phoenix, Tucson, and Douglas. The entire trip from the Coast to El Paso, a distance of 800 miles, will consume but 8½ hours.

Eastbound planes leave Los Angeles at 8:00 a. m.; Phoenix at 1:20 p. m.; Tucson, 2:40; Douglas, 4:00; and arrive at El Paso at 5:30 p. m., Mountain Time, and connect with the Texas and Pacific train leaving El Paso at 7:15 p. m.

The westbound Sunshine Special, which arrives at El Paso at 8:00 a. m., connects with the Standard Airlines plane departing at 9:00 a. m. The plane reaches Douglas at 10:30 a. m., Tucson, 11:50 a. m., Phoenix 1:10 p. m., and Los Angeles at 4:30 p. m., Pacific Time.

Standard Airlines, Inc., has installed a

4,902; passengers carried, 18,427; miles traveled, 31,600.

In addition to these figures the Standard Airlines, which is a subsidiary of the Aero Corporation of California, flew 156,000 miles during 1928 on a tri-weekly schedule between Los Angeles, Phoenix, and Tucson.

**THE** location of the Air Corps Reserve now at Santa Monica will be changed to Long Beach according to War Department announcements. The change will be made before July 1, 1929.

#### Air Mail Lines

**PAUL L. CARPENTER**, formerly distribution manager for the Alexander Aircraft Company, has been added to the traffic department of the Standard Airlines, Inc.

**TWENTY-FOUR-HOUR** shop service has been inaugurated at the Aero Corporation of California field. The staff has been increased, and a three-shift schedule has already been started.

#### Long Beach Notes

By F. Stanley Selover.

**BERNHARD LAUSCHER**, a former German war ace, is an instructor for the O'Donnell School of Aviation at the municipal airport. A lieutenant in the German Air Forces during the war, he was twice brought down in battle. He had five Allied planes to his credit.

Prior to coming to the United States in August, 1927, he was a pilot for the Deutsche Luft-Hansa and was granted a Government permit upon reaching America. He flew for an Eastern line before joining O'Donnell recently.

**ONE** transport, two limited commercial and two private pilot licenses were recently awarded to students of the O'Donnell School of Aviation.

**NIGHT** flying has been instituted into the advance training course of the O'Donnell School of Aviation, according to J. Lloyd O'Donnell, head of the school.

The school has 287 active students taking instruction. Operating as a Department of Commerce accredited school, ground classes are conducted every Friday evening in a specially constructed room on the second floor of the O'Donnell hangar, and illustrated lectures are given, in addition to instruction in navigation, meteorology, airplane motors and construction, theory of flight and other subjects pertaining to aviation.

Among those who have lectured to O'Donnell students recently are George Irwin, aviation engineer of the Richfield Oil Company, and Dick Richards, representative of Berry Brothers.

Forty thousand dollars worth of equipment is used by the school and three transport pilots are kept busy instructing students and carrying passengers. The pilots are Frank Wallace, manager of the school; Bernhard Lauscher and O'Donnell.

(Continued on next page)

radio network over the proposed route and will receive accurate weather reports.

**THE** Aero Corporation of California school in Los Angeles has inaugurated a new 24-hour flying course which gives students sufficient solo time to qualify them for a private pilot's license. This course includes complete primary training, covering spot landings, dead stick landings, forced landings, and all necessary aerobatics in addition to the ten hours of solo required to obtain a private pilot's license.

**FLYING** activities at the Aero Corporation of California during 1928 were as follows: flying hours, 3,050; student trips,



*This is the instrument board of the J-5 Travel Air, in which San Diego Air Service students learn advanced flying.*

## The Heavy Gun!

After 20 or 30 hours of snappy "Air Service" primary Training in new Warner Scarab powered Travel Airs, under the eagle eyes of army-trained instructors.... YOU'RE PUT ON THE CONTROLS OF A WHIRLWIND TRAVEL AIR.... always with a parachute as standard flight equipment.

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If you are interested in a school that knows no activity but student training; a school that has no other interests but those of its students.... you are cordially invited to write for full particulars.

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**SAN DIEGO, CALIFORNIA**



## BOBBY TROUT VS. THE GOLDEN EAGLE

By F. E. SAMUELS

ANOTHER record hung up on the aviation line of Los Angeles brings Bobby Trout and the little Golden Eagle into the limelight again. On January 2nd, Miss Trout set a record of sustained flight for women of 12 hours and 11 minutes. This record was only held by her of less than a month, when Elinor Smith took it away from her at New York by remaining in the air 13 hours and 17 minutes. But Bobby decided that the record should come back. Consequently, on Sunday, February 10th, at 5:10 p.m., she took off from Mines Field in the little 60 h.p. LeBlond motored biplane and remained in the air until 10:15 Monday morning, or for 17 hours and 5 minutes, beating Miss Smith's record by nearly four hours.

The little Golden Eagle, weighing loaded 1,537 pounds took off in less than 2,000 feet, and had it not been for the plane's skidding in a muddy spot on the runway, would have gotten off much sooner. On the take-off, the tanks contained 80 gallons of Richfield aviation gasoline, and on landing, there was still four gallons in the tanks, equivalent to 1½ hours more in the air, but unfortunately on the take-off a pebble about the size of a pea was picked up and by some means worked into the carburetor and then into the gas feed line, partly stopping up and causing the motor to miss considerably.



Bobby Trout, record-holder

At eleven o'clock Sunday night, her flying lights failed and for the balance of the night she flew without any between Mines Field, where a searchlight had been installed, and the Aero Corporation of California Field, where the beacon lights were kept burning all night.

Miss Trout, so that her laps might be checked up, flashed a small flash lamp as she made the turns, where a man was stationed to check up the distance flown.

Bobby Trout not only has made a new record for sustained flight by a woman, but in addition has broken the night flying

record for women. She also established an American distance record (over a closed course) of 932 miles for her particular type of plane, with a record-breaking average speed of 50.29 miles an hour.

The new marks were attested to by Dudley Steel, chairman of the National Aeronautic Association contest committee here. The N.A.A. timers at the field were Jos. Nikrent and Antar Deraga, both connected with the Meteorological Department of California.

Miss Trout has a personality hard to equal, nerve and courage aplenty and is a real pilot and air-navigator.

## OAKLAND AIR NEWS

By HOWARD V. WALDORF

CONSTRUCTION of a 37-room hotel is to be the next step in the development of the Oakland Municipal Airport. Plans for the structure, to cost approximately \$40,000, have been approved by the port commission and bids for construction and operation of the improvement will be advertised for soon.

AIR mail, passenger and express service between Oakland and Mexico City is to be inaugurated within four months, according to plans of an organization headed by Carlos Alarcon, Lower California rancher. Trimotored planes, fitted with radio for two-way plane-to-ground communication, will be used. Oakland Municipal Air-  
(Continued on next page)

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Gentlemen: I am interested in your course of flying instruction. Please send me your catalog.

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Say you saw it in AERO DIGEST



(Oakland Air News continued)

port has been selected as the northern terminus. The tentative route calls for stops at San Diego, California, and Ensenada, Lower California.

THE huge increase in daily cargoes has resulted in the assignment of four postal clerks to duty at the air mail office at the Oakland Municipal Airport. The mail was formerly handled by one clerk, Gerald Worthley.

HANGAR No. 4, measuring 300 by 142 feet and providing space for the housing of 60 average size planes, has been placed in service at the Oakland Municipal Airport. Offices of supply organizations and commercial flying services have been opened in the lean-to extending the length of the hangar.

AN exclusive contract for teaching the Weems system of air navigation in the San Francisco Bay region is held by the Elliott & Duck Flying Service at the Oakland Municipal Airport.

FOR the purpose of providing night air mail pilots with accurate ceiling reports along their run, 20 ceiling lights are being installed along the Seattle-Los Angeles airway under the direction of D. M. Little, Federal meteorologist.

W. J. (Red) BARROWS, forest patrol flier, heads the re-organized Pacific Coast Air Service at the Oakland Municipal Airport. Pilots include Frank Moore and Harry Blunt.

MAJ. LIVINGSTON IRVING has taken over the Eaglerock agency for the four San Francisco Bay counties. A sales force of 50 has been organized, and branches are being established in the various cities. In addition, Maj. Irving operates a flying school. Capt. George Ream is chief pilot.

THE Aircraft Engine Company, Inc., has opened a second factory in Oakland. W. E. Wilson is president and general manager. Negotiations are now under way for the establishment of a larger factory, to have an output of 10,000 engines a year.

A new method of transmitting the latest weather reports to the pilots of airplanes in flight is being tried out by the Department of Commerce at Livermore, Calif., 30 miles southeast of Oakland Municipal Airport.

A row of lights, similar to the railroad block signals, has been installed at the Livermore emergency landing field. The lights are arranged in groups, each representing one of the San Francisco Bay region airports.

In each group is a fixed light. When it shows green, the weather at the particular locality it represents is clear. A yellow light stands for caution. A red light means "impossible flying weather, land immediately."

COMMERCIAL services at the Oakland Municipal Airport got off to a flying start during the first month of 1929, according to records filed with the port commission. The January operation records of the commercial services at Oakland Airport, representing a 300 per cent increase over the corresponding period of 1928, follow: landings, 4,853; passengers, 2,934; student flights, 556.

TO protect the Oakland Municipal Airport pilots from the competition of barnstorming fliers, the port commission has approved a schedule of rates for transient operators. The rates per day are as follows: two-place plane, \$33; four-place, \$42.50; six-place, \$53; over six-place, \$69.50.

PORT ordinance passed recently by the Board of Port Commissioners limits the height of structures within 1,000 feet of the Oakland Municipal Airport to 50 feet.

THE Board of Port Commissioners, which controls local airport affairs, is assisting the N. A. A. chapter in the establishment of the proving ground and has authorized the purchase of three F. A. I. certified stop watches, two high-altitude barographs and two barographs for endurance and low-altitude flights.

Measured courses will be established at Oakland Municipal Airport in the near future in order that manufacturers may test their planes there.

# RESOLVE *During 1929* TO *Fly Safe!* Provide yourself with a **RUSSELL "Lobe" PARACHUTE**

for that  
**EXTRA factor**  
of safety

FOR only \$250 to \$350 you can have a 1929 Russell "Lobe" Parachute—representing the highest development in aerial life-saving equipment. In an emergency you simply pull the release ring—the parachute does the rest. No springs, no rubber bands, no pilot chute—nothing to get out of order.

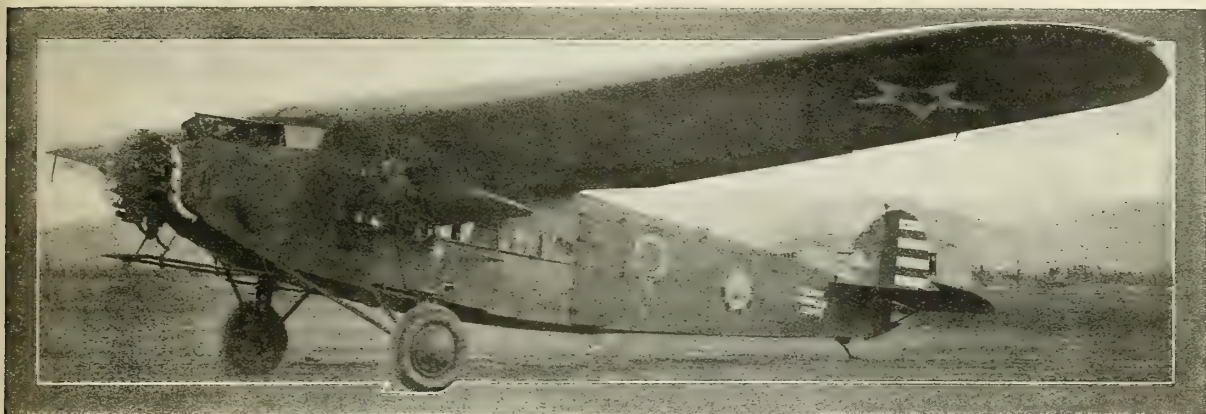
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#### DEALER FRANCHISES:

Now available to established aeronautical and sales organizations. Liberal discounts, no quota requirements.

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What does aviation hold for me

169 American Aircraft plants will produce  
airplanes and motors valued at  
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Do you want to train for this interesting work?

**T**HE school division of Airman Engineering Company offers to a selected few who answer this call promptly, a complete course in flying and aeronautical engineering for the cost of flying instruction only.

Our employment office will

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Special flying instruction under the immediate direction of "LUCKY FINCH," the originator of "The Lucky Flying Circus" and the most widely known stunt flyer and skywriter in America.

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Send me the story of "The Lucky Flying Circus" together with information on your special March Flying Instruction offer.

Name .....City .....

Street .....Town .....



## UTAH AIR NEWS

By GLEN PERRINS

**T**HE airways lighting system between Salt Lake and San Francisco was completed in February, according to W. E. Kline, division engineer of the airways light-house service. Soon after turning on the lights on the new unit, the Boeing Air Transport, Inc., is expected to inaugurate its double service, making twelve-hour instead of twenty-four-hour trips over the route.

**T**HE lights on the Varney line, between Boise and Burley, Idaho, have been installed, and the work is expected to start soon on the route between Salt Lake and Burley.

An improved service will be offered to the air mail patrons of the Varney airline, which operates between Salt Lake and Pasco, Washington, as soon as the lighting system over the route is completed.

**P**OCATELLO will soon be in a position to purchase its own airport, provided the bill allowing cities to purchase land outside city limits, which is introduced in the state legislature, passes. Since the city has no authority by law to purchase the land just across the Bannock County line, immediate action is necessary on the purchase which was financed last May by John Hood, member of the airport committee of the Pocatello Chamber of Commerce.

**T**HE Elko air mail field is now fully equipped for night flying with the latest addition of the boundary lights, which were used for the first time recently.

**A** BILL designed to provide further regulation of aircraft and operators of aircraft has been introduced in the House here by George A. Critchlow, of Salt Lake. The bill would make it illegal to operate any airplanes within this state which failed to

conform to standards of the Department of Commerce or to pilot a plane without a Federal license.

**T**HE operating offices of the National Parks Airways, Inc., will be moved to Butte, Montana. However, the executive office and headquarters of the company will remain in Salt Lake.

**A**N amendment of the state gas tax law to provide for exempting from the payment of the tax all gasoline used in air-planes, is proposed by Representative Thomas H. Burton of Juab, Utah.

**D.** B. COLYER, present superintendent of the Boeing Air Transport, Inc., has been elected vice president in charge of operations with headquarters in Salt Lake. Frank E. Caldwell, former superintendent of the Boeing Air Transport, Inc., at Omaha, has been appointed his assistant.

**T**OOELE'S AIRPORT is nearing completion, with the main beacon light of 2,000,000 candlepower now in operation. The field border lights are being installed.

**T**HE lease of 289 acres of land for the Ogden airport was formally accepted recently. Terms of the lease are that Ogden City shall pay an annual rental of \$500 for a period of five years, with an option to purchase the property at \$100 an acre at the end of that time.

The airport will be thoroughly lighted in the near future and a water supply will be provided.

**A** SIXTEEN weeks' course, treating the commercial aspects of air transportation, is announced by the extension division of the University of Utah. Homer J. Merchant, district passenger agent of the Western Air Express, Inc., is conducting the course.

**A** NEW 250,000 candlepower air mail beacon has been installed as a guide for fliers at the mouth of Emigration Canyon. An electric clock turns the current on fifteen minutes before sundown and shuts the juice off just before sunrise.

## MONTANA AIR NEWS

By C. T. SULLIVAN

**I**N the spring the headquarters of the Great Falls to Salt Lake City air mail line will be moved to Butte from Salt Lake. As soon as concrete can be poured, construction of a hangar and office for the National Parks Airways at the Butte Airport will be started.

This company plans to expand north of Great Falls to join the proposed east and west Canadian Airways, Ltd., line.

Next summer the company will probably start a passenger service between Butte, Helena, and Great Falls, which will be entirely independent of the mail.

Figures covering the operations of the company since the start of the regular service, August 1, 1928, to January 26, 1929, are as follows:

During the six-month period, 796 passengers were carried and 27,463 pounds of mail. Planes of the line were in the air a total of 1,976 hours and flew 190,593 miles.

**T**HE Commercial Airways, Ltd., of Edmonton plans to purchase three new Lockheeds. The company conducts a flying school and flies prospectors and trappers into the north.

**S**UB-ZERO flying has been the vogue in Montana for the past two months.

For the good of his soul and a better knowledge of winter flying, the Montana correspondent of *AERO DIGEST* picked the coldest day recorded in Great Falls this winter for a flight to Salt Lake City in the National Parks Airways Fokker passenger plane. Stops on the 500-mile line are at Helena, Butte, Pocatello, Ogden and Salt Lake City.

The airport thermometer registered 35 below just before Pilot Franklin Nelson took the plane off at 8:30 a.m. with the correspondent aboard.

The plane's heater worked well and no discomfort was experienced from the cold.

Though cold, the air was smooth and clear until the Idaho boundary was reached when the plane pushed its way through a snow-storm to Pocatello.

Because of the heavy snow and fog the take-off at Pocatello was rather difficult. But a little way out, we found clear smooth air.

Nelson during the flight down lunched on two meat sandwiches, several sweet pickles, a large piece of cake, cookies and a thermos bottle of coffee, which had been prepared by his wife and were handed to him by the correspondent.



An aerial view of Newport Beach, California.

# DO YOU KNOW

**THAT**

A very large number of veteran pilots, including those of the air mail and transport lines, wear the NEW DICTATOR GOGGLE?

Aviation schools and instructors all over the country prefer and recommend the NEW DICTATOR GOGGLE for pilots and students alike?

Of all goggles manufactured, the makers of the NEW DICTATOR GOGGLE enjoy a world-wide popularity for their product?

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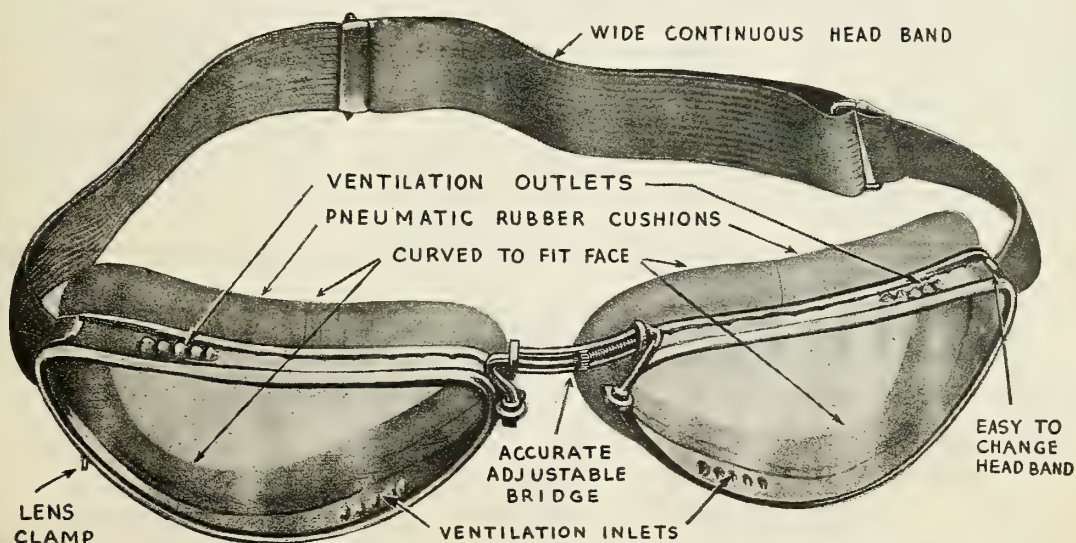
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The NEW DICTATOR GOGGLE is moderate in price, at the same time meeting all the requirements of a real aviation goggle.

It fits any face, due to the easily adjusted nose bridge. Provides wide, unobstructed and clear vision.

Is extremely light and comfortable yet very durable, as it is skillfully made of the finest materials obtainable.

All parts are easily replaced in case of breakage by accident.



You put them on and forget they are there, they never remind you of their presence.

### PRICES

With plain lenses, packed in attractive metal case.....	\$6.50
With smoke or green (fieuzal) lenses; metal case.....	7.50
Replacement lenses, plain, per pair.....	2.50
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Postpaid anywhere in the United States.

Unusually attractive offer for schools or dealers in airplanes or aviation equipment.

**NATIONAL AVIATION SUPPLY CO.**

*Exclusive Importers for the United States*

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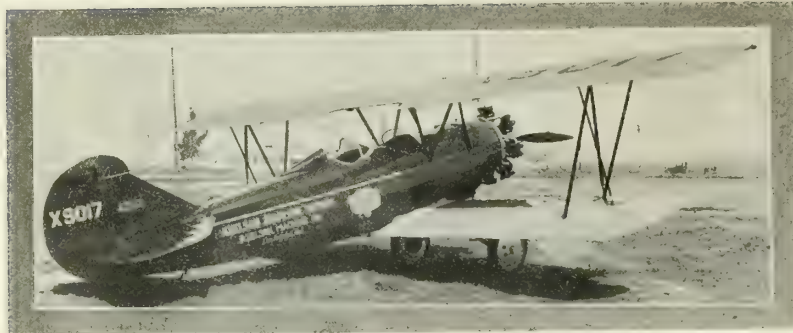
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Travel Air biplane of the Axelson Machine Co. with an Axelson engine.

## CALIFORNIA NOTES

By RUSSELL GRIGSBY

### Stockton

THE Stockton City Council has appropriated the final payment on the Stockton Municipal Airport.

Thomas Baxter has recently presented the College of the Pacific an Eaglerock training plane. Prof. Milton Lusk is teaching the ground course, and Lt. Winston, is teaching the flying course. The College of the Pacific has a very complete course from which to choose.

An underground gas station has been installed at the airport. A large sign marking the field has been painted on the hangar roof, and another on a nearby barn. City Electrician Morrell has been testing out various floodlights for the field and soon will

have a complete system of border lights, obstruction lights, and floodlights installed.

### Galt

THROUGH the efforts of Instructors Dobson and Gregg, of the Galt Technical School for Aeronautics, a squadron of 37 U. S. Army planes, commanded by Lt. Beasley, recently made a cross-country flight from March Field, to Galt Field. They carried 85 officers and cadets.

The squadron consisted of one trimotored Fokker transport, one Boeing P.W. 90, two Douglas 02s, twelve Whirlwind Consolidateds, and nineteen Liberty DHs.

### Modeste

A CLASS in navigation and meteorology, sponsored by the Modeste High School and the Modeste chapter of the National Aeronautic Association, was inaugurated

February 11. Capt. W. B. Vertmeyer, of Oakland, is the instructor.

Penfield Bros. are very busy teaching flying and carrying passengers. They have ordered a Curtiss-Robin from Alameda.

Clarence Luthy, of Escalon, is building a new type airplane. Will Shepherd, of Riverbank, has built a small sport monoplane with a Lawrance motor.

### Glendale

OFFICIAL opening of the Grand Central Air Terminal here took place on Washington's birthday.

The Maddux Air Lines and Transcontinental Air Transport will move into the new steel hangar.

The field will cost \$3,000,000 and will have 3 concrete runways, an oiled field, and the latest equipment.

### Alameda Notes

By HOWARD V. WALDORF

OFFICES of the Alameda Airport, Inc., have been established in the \$50,000 administration building recently completed at the flying field. Capt. W. H. (Bill) Royle, head of the Royle Air Lines, at the Alameda Airport, is superintendent. The administration building contains a restaurant, passenger waiting rooms, ticket offices, banquet room and hotel rooms.

MADDUX Air Lines has established the northern terminal of its daily service to Los Angeles and Mexico at the Alameda Airport. The company has leased a hangar.

*Continued on next page*

# ADDITIONAL SERVICE

The same complete service on:

**WRIGHT WHIRLWINDS**

**SCINTILLA AIRCRAFT MAGNETOS**

**STROMBERG AIRCRAFT CARBURETORS**

available at our Los Angeles Shop, is now available with hangar service at our branch at:

**LOS ANGELES METROPOLITAN AIRPORT**

A complete line of parts and accessories, including the following will also be carried in stock:

Consolidated Instruments

Elgin Avigo Instruments

Meyrowitz Goggles

Wood and Steel Propellers

Flightex Fabric

AC and B. G. and Champion Plugs

Airtite Ignition Cable

Rusco Shock Cord and Rings

Eckles OX5's Replacement

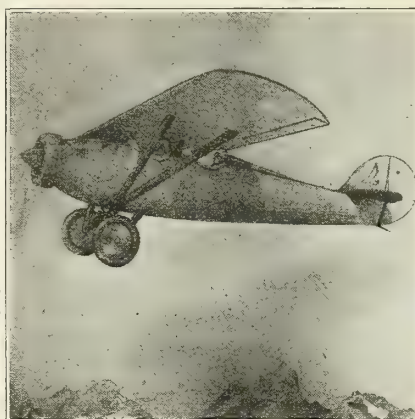
Parts



**PACIFIC AIRMOTIVE CORPORATION**  
3417 ANGELES MESA DRIVE LOS ANGELES, CALIFORNIA

Miss Bobby Trout, in

# The Golden Eagle~ breaks the record again!



The New  
Model 801  
Golden  
Eagle  
"Chief"

... truly a beauty

.... and this time sets three new world's marks for women

## SPECIFICATIONS, ETC., OF THE NEW GOLDEN EAGLE "CHIEF"

Weight empty .....	840 lbs.
Gross weight loaded.....	1350 lbs.
High speed (at sea level)...	110 m.p.h.
Cruising speed.....	95-100 m.p.h.
Landing speed (guaranteed)	
	30 m.p.h. or less
Climb at sea level (full load)	
	1200 ft. p. m.
Range at cruising speed.....	5 hrs.
Fuel capacity .....	25-35 gallons
Ceiling .....	20,000 ft.
Power plant.....	Le Blond 90 h.p.
Price, less motor.....	\$1800

## STANDARD EQUIPMENT

Propeller Cap  
Chute Seats  
Fire Extinguisher  
Emergency Tool Kit  
Curved Wing Tanks  
Dual Instrument Boards  
Detachable Engine Mount  
Consolidated Instrument Panel, including altimeter, tachometer, oil pressure gauge, oil thermometer, switch, altitude control and choke.

ONLY a short time ago Miss Bobby Trout set a World's Endurance Record for Women when she stayed aloft for 12 hours, 11 minutes. Several weeks later, again piloting *The Golden Eagle* she established the new high mark of 17 hours, 5½ minutes. She won two other honors also . . . that of being the first woman to fly solo all through the night and that of traveling farther non-stop than any other woman.

What better proof can we offer of *The Golden Eagle's* inherent flight stability, when an 18-year-old girl who weighs a mere 110 pounds and who has had not much more than 150 hours in the air has accomplished twice within a very short span of time these feats which many a husky veteran pilot has failed to accomplish?

This performance, comparable to that of larger and far more expensive planes, we guarantee: flies "hands off"; automatically banks with use of rudder only, returning to natural flying position when rudder is returned to neutral; lands at, or less than, 30 M.P.H.; lands and takes off in fields not much larger than an ordinary lot; operates at an average cost of \$1.25 per hour.

*The Golden Eagle* embodies the soundest and most progressive aerodynamic design and is built strictly in accordance with U. S. Air Service Specifications.

And now, the new *Golden Eagle "Chief"*—powered with the Le-Blond 90 H.P. motor. The "*Chief*," retaining all the fine qualities of Miss Trout's type of *Golden Eagle*, comprises many new developments and improvements. It is, by far, the most beautiful ship in America. It will, in a very short time, be the most popular in its class.

We suggest that dealers and distributors get in touch with us without delay regarding exclusive territories and franchises, liberal discounts, etc. This ship is "going over big." And it won't be long before the entire territorial distribution is covered.

# R. O. BONE CO.

415 Industrial Avenue  
Inglewood, Calif.



(Alameda Notes continued)

**FIFTY-FIVE** students are taking flying instructions at the Royle Air Lines school at Alameda Airport. Instructors include Jerry Andrews, Milo Campbell, and Vic Hoganson.

**A** TELEGRAPH printer, connecting the flying field with the other stations of the Pacific Coast network of upper air weather reporting service, has been installed at Alameda Airport.

## CALIFORNIA

### March Field Notes

By E. M. Slaughter.

**THIS** year at March Field, thirty-six new houses for officers' quarters have been erected, one bachelor's barracks and other minor buildings. There are now one hundred seventy students taking training and one hundred twenty planes being used for instruction. There are nine hundred officers, non-coms, and cadets stationed at March Field now. The new Douglas 02-K is the advanced type of ship now being introduced for the student body.

## THE PROPOSED HAWAIIAN AIRLINES

By Vern Hinkley

**ORGANIZED** business in Hawaii has at last turned its serious attention to an inter-island airline here. Each of two thoroughly established groups of Honoluluans proposes to operate the most modern of aircraft between Honolulu and the islands of Molokai, Lanai, Maui, Hawaii and Kauai for passenger, freight and mail carrying. Each has the necessary financial backing, and each has available the advice and cooperation of men who are authorities in the realm of aviation.

One is the Inter-Island Steam Navigation Co., a corporation which has been running steamships throughout the archipelago for more than 40 years. Its plan to augment its surface activities by an aerial branch is the outgrowth of a careful survey, conducted over a period of months, by Carl H. Dolan, Jr., former member of the Lafayette Escadrille and later an air engineer in the service of the Chinese Nationalists.

The other concern is the Hawaiian Airways, Ltd. Its management is seeking the services of Captain Lowell H. Smith, Air Corps, last of the Army's 'round-the-world fliers to remain in the military service, as technical adviser and actual organizer of the line. Captain Smith has announced his intention of requesting a year's leave of absence that he may identify himself with the Honolulu group.

Since the announcements of both companies not long ago, there has been some talk of a merger. It is entirely evident that there is no room in Hawaii for two competing airlines. This fact is being considered and it is safe to say, in the absence of a definite pronouncement, that should no combination of forces be effected, one or the other of those in the field will drop out of it.

It has been rather definitely settled that

amphibians will be the machines used for transport. For Hawaii, separated as it is by channels varying in width from 30 to 100 miles, the amphibian provides an element of safety which cannot be overlooked. The amphibian to be selected will be a bi-engine type.

Landing facilities for such craft are available on every island of the territory. On Oahu there is the John Rodgers airport, situated on the shores of Pearl Harbor and consequently usable by land and seaplanes. On Kauai there is Nawiliwili Bay, a smooth, sheltered expanse of water. On Kauai there is also the Port Allen landing field, used jointly by the Army and civilian planes. This field is to be enlarged at a later date, as is the John Rodgers airport. Molokai, the leper island, in the central portion is nothing but a vast airdrome, smooth as a floor, miles long but otherwise absolutely unimproved. Maui, except for the harbors at Kahului and Lahaina, has no landing facilities of any sort, although plans for a field near Wailuku are being drawn. Hilo has its own airport, also to be enlarged, and in addition the vast stretches of Kuhio Bay.

Lanai, a separate kingdom in itself given over solely to the production of pineapples, like Molokai is virtually nothing but a landing field. In addition, it has sheltered waters on the southeast where amphibians would find safe haven.

The new Hawaiian airline will be conducted under the supervision of the Territorial Aeronautical Commission, and the United States Department of Commerce. The former body has spent more than \$100,000 in its preliminary work and proposes to use a sum far in excess of this figure to complete its task. Colonel Perry M. Smoot, adjutant general of Hawaii and commission chairman, has gone to the mainland where he is making a first hand survey of air developments there. He will bring back with him many new ideas which are to be put into effect here.

Improvements which are scheduled already include the enlargement of all territorial landing fields, the erection of hangars, the construction of ramps for use by seaplanes and amphibians, the installation of a radio communication system by which pilots will keep in touch with their headquarters, establishment of waiting rooms and pilot quarters, floodlighting of fields at night and possibly a supplementary meteorological service to work in conjunction with the Government weather bureau here.

A commercial air service here will save its patrons any amount of time. The territory, from Kauai at the northwest to Hawaii at the southeast, stretches for more than 350 miles. A steamer passenger from Port Allen or Ahukini, Kauai, is forced to spend at least 26 hours at sea in reaching the port of Hilo, Hawaii. This does not include the 10-hour layover between steamers required at Honolulu. By air it will be possible to go from Port Allen to Hilo in less than five hours, non-stop. From Honolulu the voyager by air can reach Hilo in two hours and a half, Maui in a little more than an hour, Molokai or Lanai in 45 minutes

and Kauai in an hour and a half. Planes returning from Hilo to Honolulu, aided by a quartering trade wind, have done the distance in two hours.

## HONOLULU AIR NEWS

By VERNE HINKLEY

**THREE** new members have been named by the governor for Hawaii's aeronautical commission. They are Commander V. D. Herbst, commanding the naval air station at Pearl Harbor; Chester Clark, Jr., a former World War flier, and Charles H. Dolan, Jr. The latter, once a member of the Lafayette Escadrille, later went to China as a United States Government air engineer.

**SEVERAL** Hawaiian department Air Corps officers have been ordered to take station at other fields. Those who are to leave on the next transport are: Capt. Lotha A. Smith, Lieut. Robert J. Brown, Jr., Lieut. C. D. McAllister, Lieut. Joseph T. Morris, Lieut. George W. Polk, Lieut. Leon E. Sharon, Lieut. Gilbert E. Tefft, and Lieut. Lee Q. Wasser.

**HAWAII'S** need of a commercial air service was voiced by Governor Farrington after he returned January 13, from Hilo in the Army's Fokker, piloted by Capt. Lowell Smith. The trip was made in two hours, 10 minutes.

**ALFRED H. SHUTTLEWOOD**, president of the Hawaiian Aeronautical School, has inaugurated a plan of making all students learn plane construction and theory before taking to the air. A plane is now under construction by the students at the school in Honolulu.

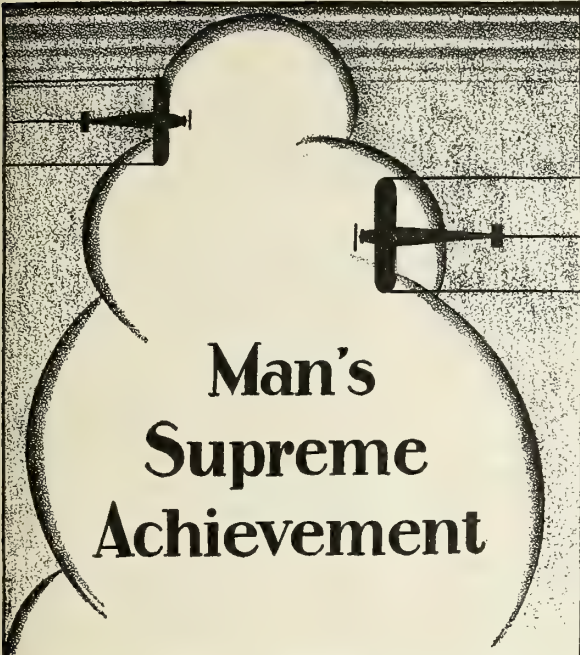
## ARIZONA AIR NEWS

By HAROLD G. WILSON

**REGULAR** classes in aviation are being given Tucson High School students in a free course sponsored by the Flying Wildcats, student organization of fliers and students. General subjects are covered and visiting fliers are asked to speak before the young air fans. A history of aviation is included in the course. R. C. Denny is president of the organization.

**AN** appropriation of \$4,000 has been made for an airport to be established at Bisbee, in Cochise County, near the international line. The work will be done by the supervisors with the assistance of the Bisbee Chamber of Commerce aviation committee, of which Harry Lavender is chairman. Other members of the aviation committee are I. E. Rosok, Stanley Jewell and G. C. Pidgeon.

**EXTENSION** of the Maddux Air Lines from the Imperial Valley, Calif., to Phoenix was announced for February, as the next step in the extension of the lines of this operating company. The Arizona line is to operate between Phoenix and Los Angeles.



# Man's Supreme Achievement

The hum of a mighty industry echos through the heavens. Legions of aircraft soar swiftly along the upper stretches, conquerors of the sky... Man's supreme achievement.

Now the world demands air service for mail, transportation, etc. And the aeronautical industry demands trained men; not only pilots but engineers, designers.

Heed the clarion call of opportunity that drums down from the skies. Begin your preparation to enter this great industry by sending a request for our catalog and study course. Western College of Aeronautics is one of the foremost aviation institutions in the world. Here you receive the training so vitally necessary to insure success in Aviation.

Request Illustrated Catalog.



## Western College of Aeronautics

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## ALEXANDER EAGLEROCK POPULARITY IS DESERVED

ITS sturdy and husky construction make it a favorite with old time and experienced instructors for the training of students.

ITS large fuel capacity, protection to passengers and pilot, stability and durability make it a dependable plane for aerial taxi and cross country flying.

ITS large pay load capacity, attractive appearance, and low operating cost make it a popular passenger carrying plane for sight seeing flights.

FOR all these reasons the Eaglerock has become a choice of the private plane owners who fly for pleasure.

INVESTIGATE the new model Eaglerock powered with HISSO "A" motor. (Approved type certificate No. 59.)

*Fill out and return coupon*

**AERO CORPORATION OF CALIFORNIA, Inc.**

9401 So. Western Ave., Los Angeles

*California & Arizona Distributor  
of Alexander Aircraft*

Name .....

Address .....

City ..... State .....



## OREGON AIR NEWS

By C. K. LOGAN

**F**IFTEEN acres nine miles south of Ashland, used as an emergency landing field, is to be equipped with boundary and beacon lights. Other beacon lights will be installed on the summit of the Siskiyou mountains, Dunne Butte and on the Gallatin ranch near Ashland.

**D**EVELOPMENT of a permanent airport for Grants Pass is seen in the organization of an airport commission with Gladwin C. Smith as chairman, and J. E. Kerr, secretary.

**E**LBERT PARMENTER, of the Parmenter School of Flying at Corvallis, has obtained a local agency for the American Eagle airplane through the Mackenzie-Morrow Aviation Company of Portland, district distributors.

**A**LFRED ADAMS has moved his Waco from the Pacific Airplane Service Field at Salem to the American Legion airport at Silverton and expects to start his own flying school.

**T**HE Pacific Airplane Service of Salem has changed its name to the Eyerly Aeronautical School, headed by Lee U. Eyerly. Kenneth Rodgers is now field representative. Preliminary work has been completed on the cabin monoplane constructed at the school.

## NORTHWEST AIR NEWS

By F. K. HASKELL

**C**ONSTRUCTION has commenced on a special training plane to be used by all flying schools enrolled in the Rankin System, Inc., according to George E. Elowe, president of the Aircraft Builders Corporation and vice president of the Rankin System. With 51 schools now using the Rankin System, a market for the new ships is already available.

**R**EPRESENTATIVE George E. Canfield has submitted a bill in the Washington legislature to build two emergency landing fields in the Cascades to aid fliers in crossing the mountains. One would be located at Cle Elum and the other at Bend Revenues.

**A**ERO MOTORS, INC., has been incorporated in Portland by Thomas Bilyeu, Robert B. McElroy and Robert C. Jackson.

**T**HE Longview Flying Service has been incorporated in Longview, Wash., by Jack Manning, as president, and Harry Sparks, as vice president. The new company has taken over the Longview Aircraft Company. The company now has a modern hangar. Les Meadows will be the chief pilot.

**C**ONSTRUCTION has commenced on the Government's air beacon on the Pacific Highway at Lacey, Wash. It will be of

steel, seventy-five feet in height. At the top will be a lamp of 3,500,000 candlepower.

**J.** E. CASEY, president of the United States Parcel Service of Seattle, has negotiated with four air express services. Parcels will be trucked to airports and there loaded on planes of the Union Air Lines, Aero Corporation, Pickwick Air Lines and Maddux Air Lines.

**P**URCHASE of the Watts airport at Beaverton, Ore., by the Breese Aircraft Corporation and plans for the immediate transfer of the company from San Francisco to Portland and Beaverton were recently announced by George H. Wisting. The company's production plans call for the building of some 50 ships during 1929, all of the five-passenger monoplane type. Designs for the craft were made by Vance Breese president and chief pilot, and J. K. Northup, aeronautical engineer. Each plane will be powered with a 200 horsepower Wright motor and will have an air speed of about 130 miles an hour.

Nelson E. Jones, who negotiated for the purchase of Watts Field, will continue as general manager of the corporation, and Bradley A. Ewers, Portland attorney, treasurer and counsel.

**E**ARLY in the spring, the Hobi Airways Company will start a regular passenger service between Grays Harbor and Puget

(Continued on next page)

## PERPETUALLY BETTER STEARMAN AIRPLANES

Distributed in  
SO. CALIFORNIA and ARIZONA  
by

**ROGERS AIRCRAFT, INC.**  
3901 ANGELES MESA DRIVE  
LOS ANGELES, CALIF.

## BARNEY'S S-1



A small, roomy, two-place, high wing, cabin or open cockpit monoplane. Ideal for sport or student instruction.

Barney's S-1 provides visibility unsurpassed in any other ship. The wheels may be seen at all times and when the ship is in flying position the ground may be seen for 30 feet ahead.

Welded steel tube fuselage; shock cord sprung, split axle type landing gear; adjustable stabilizer; unusually sturdy wing construction.

Ship, less motor and instruments, \$1,275. F. O. B. San Diego, Cal. Complete set of plans for building ship, including Barney's Dope Sheet, \$10.00. Send 10c for descriptive literature.

**BARNEY SNYDER, 3706 49th St., San Diego, Calif.**

## BURGESS DRY CELL BATTERIES

Flashlight, Radio, Ignition  
and for low voltage lighting



Uniformity insured by scientific precision in manufacture. Longer life assured by Chrome, which guards power when the Burgess Battery is not in use.

**BURGESS BATTERY COMPANY**  
General Sales Offices: Chicago

## Aeronautical Supplies

300 h. p. (used) Hisso Engines . . \$295.00

Dixie 800 (used) Mags. . . . . 27.50

Hi-Compression OX5 Pistons . . . 4.75

New Hisso Pistons, Hi or Low . . . 5.75

## SPILLANE & CO.

LOS ANGELES, CAL.

Oakland Airport  
Tr. 1561

4512 So. Main St.  
Axridge 8981

**BUY****Miller Airplane Products  
FOR YOUR OX-5**

And if you have any Miller Product with which you are not entirely satisfied it is your own darn fault if you don't write and give us the opportunity to back up our iron bound guarantee.

Your Motor's efficiency can be greatly improved by the use of the following:

"Rev's for OX's," by Leslie C. Miller, covers methods of improving power, reliability, and economy; price, \$1.00.

Miller Overhead Assembly, many times outlasts original Overheads.

Miller Roller Rocker Arms, save the Valve Guides.

Miller Intake Valve Controls, increases revs and saves gas.

Miller Valve Guides and Seats put the cylinders back in service.

Miller 3 Ring, Medium High-compression Pistons, increase power.

Miller Valve Guide Jig, for replacing Guides in your own shop.

Miller Valve Seat Set, in conjunction with the Guide Jig replaces the seats.

Miller Reamer Sets, etc., are indispensable when grinding valves.

We also sell numerous other necessities, including the German Bosch Magneto, Bosch Spark Plugs, Bosch Ignition Cable, and last but not least the Bosch Breaker Assembly to fit Berling Magnetos.

*Write or wire to us direct, or to any of our representatives, for descriptive folder and price list.*

**MILLER AIRPLANE PRODUCTS**

3827 West Jefferson Street

Los Angeles, California

Phone, Empire 3570

**DISTRIBUTORS**

Logan Aviation Co.  
716 West Superior Ave.  
Cleveland, Ohio

Nicholas-Beazley Airplane Co.,  
Inc.

Marshall, Missouri

Johnson Airplane & Supply Co.  
Dayton, Ohio

Robertson Aircraft Corp.  
Anglum, Missouri

**COOPERATION!**

ENABLED THE ESTABLISHING  
of  
THREE WORLD'S RECORDS

*Question Mark*

*Bobbie Trout (first record)*

*Capt. Frank Hawks*

at the

**LOS ANGELES  
METROPOLITAN AIRPORT**  
within the first 35 days  
of the New Year

Cooperation helped to increase the number of airplanes based at this port from one to thirty-three since Dec. 1, 1928.

**Operators**

Bach Aircraft Co.  
Commercial Aircraft Co.  
Pickwick Airways  
Morrison Aircraft Co.  
Royal Flying School  
Lt. Williams School of  
Aviation  
Glenn Hall Co.  
L. H. Hayes  
H. C. Lippiatt  
Roland-Frost  
Geo. R. Craig Co.  
Lockheed Aircraft Co.  
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Ambassador Airways  
Aero Safety Appliance  
Co.  
Golden Arrow School of  
Aviation

Aero Wire Service  
Aero Brokerage Service  
Co.  
Kingston-Rhodes  
Airways  
Law-Gilpin  
Pacific Aeromotive Corp.  
J. S. Schofield  
Stan Petit  
Mark Falk  
R. C. Merriam  
Roscoe Turner  
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C. B. Hurtt  
Ken Maynard  
Mrs. Rankin Barnes  
Barton and Carson

OUR COOPERATION WILL HELP YOU ESTABLISH AN ADVANTAGEOUS CONTACT WITH THE AVIATION INDUSTRY

*INVESTIGATE NOW.*

**Los Angeles Metropolitan Airport**

Heffron-McCray-St. John, Developers

**Airport:**

Executive Offices:  
411 Hollywood Security  
Bldg.  
Hollywood, Calif.  
Phone Gladstone 1165

Saticoy & Woodley Sts.  
in the San Fernando  
Valley  
P. O. Box 1338  
Van Nuys, Calif.  
Phone Van Nuys 522

**WALDO D. WATERMAN**  
*General Manager*



(Northwest Air News Continued)  
Sound, and also between Grays Harbor and Eugene, Ore. The company will operate a tri-weekly service.

The company has taken over the exclusive sales rights on the Travel Air line of ships for Oregon and Washington

**M. I. DAVIS**, of the West Coast Aviation Company, has announced plans for a flying field and school to be established at Mt. Vernon, Wash.

## WASHINGTON AIR NEWS

By C. M. LITTELJOHN

**HAROLD CRARY** is the new director of advertising for the Boeing Airplane Company. Mr. Crary was formerly the publicity manager of the Seattle Chamber of Commerce, and until recently was manager of the American Air Transport Association at Chicago.

**THE** Commercial Air Transport Company has been formed at Bellingham for the purpose of training citizens of that city in flying and commercial aviation in all its branches. It will also offer the community a commercial flying service.

**THE** Seattle Flying Service of Seattle has recently changed its name to the Gorst Air Transport, Inc., Seattle. Launching a large expansion program, this corporation has also changed its capitalization from \$25,000 to over a quarter million dollars.

The company plans to establish a new air mail route between Seattle and Juneau. The corporation would equip a Seattle factory and manufacture seaplanes for this run.

**A** NEW bill to make it incumbent upon pilots and all aircraft in the state of Washington to carry a Department of Commerce license has been introduced in the state legislature at Olympia by Senator William Conner of King County.

**E**RECTING new hangars, telephonic communications, beacons and other improvements, members of the Wenatchee Chamber of Commerce, are developing the community airport. Roads to and in the field are being widened. Some of the runways are being surfaced to facilitate landing and taking off.

**I**N order to secure a gift of \$290,000 offered by the Guggenheim Fund for an aviation building and course at the University of Washington, Seattle, senators at the state legislature passed unanimously a bill to appropriate \$50,000 for equipment of an aeronautic building.

**A**T the annual meeting of the Pacific Air Transport, W. E. Boeing and P. G. Johnson were elected chairmen and president, respectively. A. K. Humphries of Seattle was elected vice president; C. Bradshaw of Portland, secretary; O. W. Tupper, of Seattle, treasurer; and E. Brink, of Seattle, auditor.

**L**IEUT. ALEX HOLDEN has been promoted to the presidency of the Washington Aeronautical Corporation, Tacoma, Wash., which conducts a school, is distributor for five planes, and also has the forest fire patrol contract in this district.

## COLORADO AIR NEWS

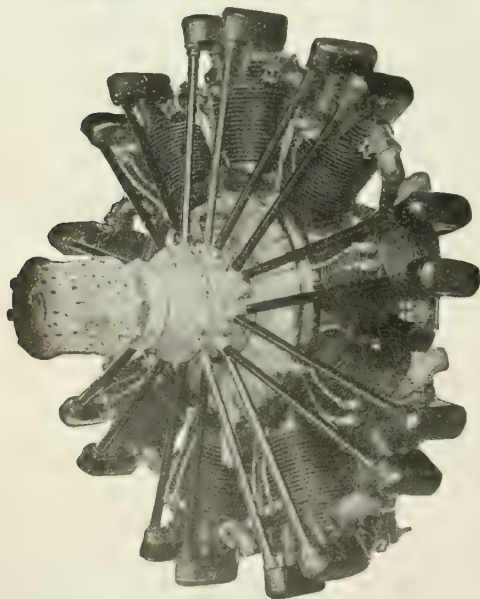
**S**EVENTEEN Eaglerock distributors are offering free flying courses to the college students in their territories who make the best efforts to win the aeronautical scholarship awards sponsored by the Alexander Aircraft Company. Students of 183 colleges have filed their first papers. Awards will be made June 1.

**T**HE Alexander Aircraft Company has engaged the services of the firm of Stevenson, Harrison & Jordan, management engineers, to survey methods in the Alexander factory and install an improved system of production control.

The experts were retained in line with the company's program of increasing production 300 per cent in 1929.

**F**IFTEEN distributors and as many dealers attended the three-day session of the national sales convention of the Alexander Aircraft Company held recently in Colorado Springs. A greater part of the convention was given over to discussion of new methods of interesting sales prospects. The sales convention will probably become an annual affair.

# MENASCO



This powerful engine possesses engineering perfection of the finest degree, insuring dependability and long life.

\$3250 F. O. B. Los Angeles

Specifications on request

**MENASCO MOTORS COMPANY**

6718 McKinley Avenue

Los Angeles



**THE MAXIMUM SAFETY  
AIRPLANE CO., INC.**

5111 SANTA FE AVE.  
LOS ANGELES

WRITE FOR  
CATALOGUE

*A wider range  
of WHIRLWINDS  
to spread a wider  
confidence!*

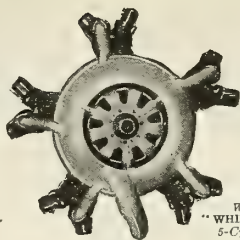
MORE than ever Wright Whirlwind Engines offer to forward-looking plane manufacturers increasingly greater possibilities for larger sales and sounder satisfaction.

In offering the famous Wright Whirlwind Engine in three power sizes, 150 H.P., 225 H.P. and 300 H.P., with 94% component part interchangeability, the advantages secured to plane builders are obvious. Smaller inventory and shorter repair and overhaul periods in servicing become the "edge" upon which sales are consummated.

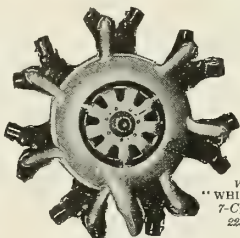
To those air-line operators who are alive to the possibilities that lie in the increased confidence, quicker public acceptance, faster turnover of revenue, shorter overhaul periods, and consequently greater profits, Wright Whirlwind powered transport planes maintain a leadership in steady, reliable performance.

Behind Wright Whirlwind Engines stands a nation-wide Service Organization reaching into every aviation center.

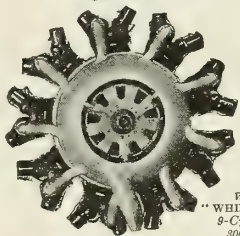
*The public knows and trusts  
Wright Engines*



Wright  
"WHIRLWIND"  
5-Cylinder,  
150 H.P.

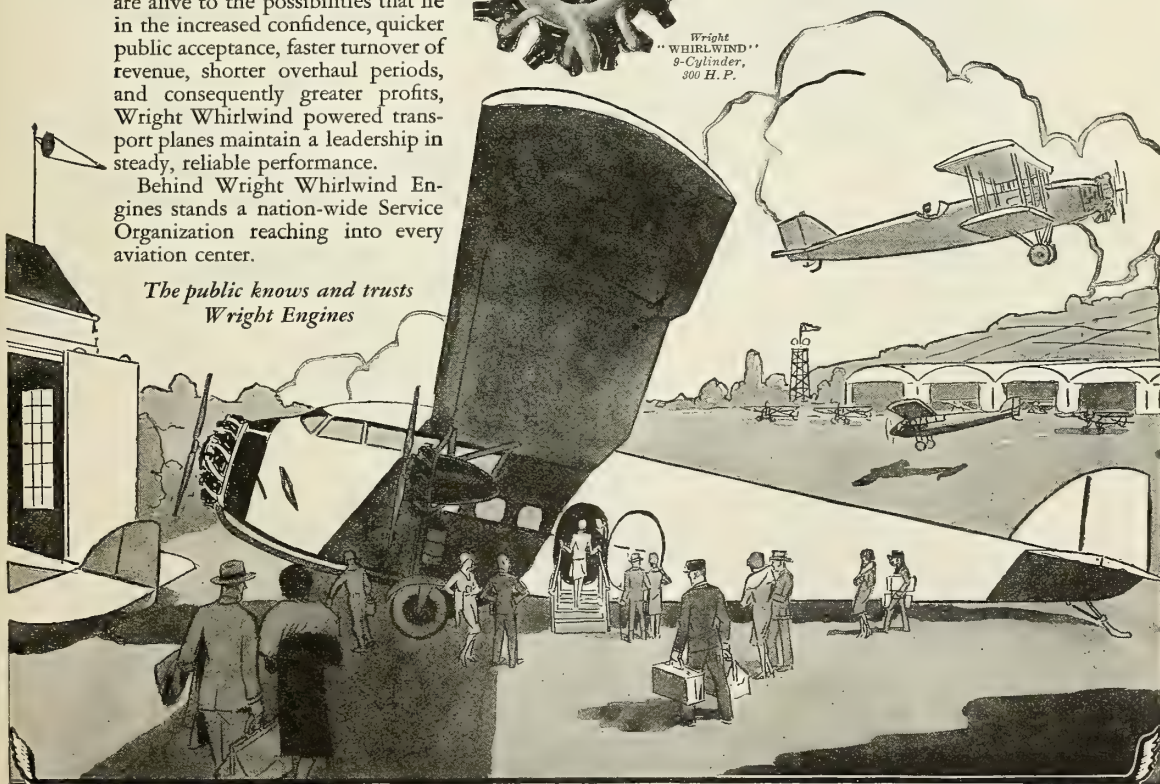


Wright  
"WHIRLWIND"  
7-Cylinder,  
225 H.P.



Wright  
"WHIRLWIND"  
9-Cylinder,  
300 H.P.

*Daily—Hourly the  
World Increasingly  
Responds to the Call  
of the Swift Avenues  
of the Air—with  
Confidence in Safety!*



*More power  
to the wings  
of the world*

# WRIGHT

*The first  
name  
in flying*

WRIGHT AERONAUTICAL CORPORATION, Paterson, New Jersey, U. S. A.

CANADIAN WRIGHT LIMITED, Sole Licensees for Canada, Montreal

AUTHORIZED PARTS DEALERS

Air Associates, Inc., Curtiss Field, Long Island, N. Y.

Pacific Aeromotive Corp., Los Angeles, Cal.

Stout Air Services, Inc., Dearborn, Mich.

Say you saw it in AERO DIGEST





# The AVIAN

## THE AVRO AVIAN

—the outstanding sport and training plane of the world—is being put into production under sole royalty rights in the United States with the trade-mark, Whittelsey Avian.

Pending deliveries of Whittelsey Avian, the imported Avro Avian will be available for purchase during March and April.



(IN ENGLAND)

*Sportsmen and flyers hail the arrival of the*  
**WHITTEELSEY AVIAN.**  
Safest—most dependable—easiest to



Showing the Avian with wings folded. Handley Page Slotted Wings—standard equipment on all Avians

# *arrives in* AMERICA!



fly, this famous sport plane holds the following records:

First solo flight, England to Australia....Fastest time, England to Australia....Longest solo flight ever made....Longest solo flight by an American woman....Longest flight ever made in a light aeroplane....Fastest time, England to India....First non-stop flight, London to Rome.

The Whittelsey Avian will be a duplicate of the English Avro Avian—to sell at the popular price of \$4995. (Flyaway or f.o.b. Bridgeport, Conn.)



\*Air Associates, Inc., have been appointed distributors for the New York zone and have demonstrating planes at their hangar at Curtiss Field.

**C** National distribution of the Whittelsey Avian is planned, and arrangements for representation in leading aviation centers throughout the country are being made.

Interested and responsible parties are invited to write for full information regarding distributorships to:

## THE WHITTELEY MANUFACTURING COMPANY

(Formerly Whittelsey Body Company)

Main offices and plant: 180 Howard Avenue  
Bridgeport, Conn.





# AERONAUTICAL INDUSTRY

## AIR MARKING COMMITTEE REPORT

**S**IMPLICITY is the greatest need in the marking of airways, according to the report of the special Airway Marking Committee to the Department of Commerce. The committee does not find it necessary to use any other markings than those provided by the Federal Airway system.

Simplicity and effectiveness in conveying vital information to aviators without confusing them is the first requirement. The markings should give the pilot his position and enable him to orient himself; also they should indicate the direction of the nearest landing field, and the distance to it, as well as the size of the field, the equipment and the general facilities, especially those of night operation. Considering these requirements, the committee urges one standard system of marking to evade the evils experienced by motorists in the marking of roads. The careful selection of buildings on which to paint the markers, where prominence and lack of smoke aid the pilots, is advised.

The committee, which has rendered the report after many studies, tests, and flights, during the past year, is composed of Chairman Harry H. Blee, chief of airport section, Department of Commerce; Lieut. A. P. Flagg, Bureau of Aeronautics, Navy Department; Woody Hockaday, National Airway Marking Ass'n; Capt. Harold M. McClelland, Army Air Corps; C. I. Stanton, Bureau of Lighthouses; and John Groves, Department of Commerce.

## AERONAUTICAL PROGRESS

**A**CCORDING to a recent report of the Aeronautical Chamber of Commerce, the capital invested in civil aircraft activities seven years ago amounted to approximately \$5,000,000; today it is several hundred millions. Seven years ago the industry employed 5,000 persons; the number now employed is about 75,000. In 1921 our total production was 302 airplanes; in 1928 it was over 4,000. Seven years ago we had less than 300 commercial pilots; now we have over 5,000. Then there were 1,200 commercial aircraft in gypsy operations; now there are 225 planes operating on regular schedule and more than 4,500 in general commercial use. Then there were no established air transport lines; today there are 39. Then there were only 2,680 miles of airways experimentally operated by the Post Office Department; today there are 16,667 miles operated by private companies flying night and day about 40,000 miles carrying an average of nine tons of mail each calendar day.

## SECTIONAL AREA MAPS RECOMMENDED

**S**ECTIONAL area maps on the international millionth scale to replace strip maps for civil use were recommended by the Committee on Air Navigation Maps to the Federal Board of Surveys and Maps. Because of the increase of flying away from designated airways, especially by individual fliers, and because of the military advantages

of the sectional area map, the new maps are urged.

The new map will give the topography and geography of the entire country by sections, rather than by the present airway strip method. The millionth scale will give sixteen miles to the inch, and will show the relief by one hundred metre contours. In this way the maps will not overlap, as the strip maps do, and each sheet will cover six degrees of longitude by four degrees of latitude.

The committee returning the report has recommended a ten-year program for completing maps for the entire country, and an annual appropriation of \$35,000.

## INTERMEDIATE FIELDS

**I**NTERMEDIATE landing fields of the Department of Commerce now in operation, or in preparation, throughout the country number three hundred eleven. These fields are thirty miles apart along the airways, and 281 will be lighted. They are divided among the states as follows: Alabama, 6; Arizona, 1; California, 24; Colorado, 6; Connecticut, 1; Georgia, 8; Idaho, 8; Illinois, 15; Indiana, 17; Iowa, 15; Kansas, 6; Kentucky, 2; Massachusetts, 2; Michigan, 2; Minnesota, 3; Missouri, 12; Montana, 7; Nebraska, 19; Nevada, 15; New Jersey, 3; New York, 9; North Carolina, 7; Ohio, 14; Oklahoma, 12; Oregon, 10; Pennsylvania, 24; South Carolina, 3; Tennessee, 1; Texas, 2; Utah, 19; Virginia, 5; Wisconsin, 7; Wyoming, 15.

Many of these fields are now lighted, and others will soon be so equipped.



The Keystone Patrician which is now making a tour of the country.



## WINTER FLYING

PROVES THE SUPERIORITY OF THE  
**BERLINER MONOPLANE:**

THESE SHORT WINTER DAYS—when the sun drops suddenly out of sight—and you know that in ten minutes night will be all around you like a tent—and you're nearly twenty miles from home—and the inevitable head wind seems to grow stronger every minute—

THEN you appreciate the **ADDITIONAL MILES PER HOUR** that are built into every **BERLINER MONOPLANE**.

AGAIN, AT THE AIRPORT—when the raw winds are gusty and uncertain—tricky air pockets are everywhere—and you watch obsolescent little biplanes take off with many a dip and wobble and waver—while your **BERLINER MONOPLANE** flies itself off the ground with the steadiness of a ship many times its size—and lands with an equal smoothness—THEN you are glad to have the up-to-date, inherent **STABILITY** of the **BERLINER MONOPLANE**.

## The Berliner Monoplane

with OX-5 Engine

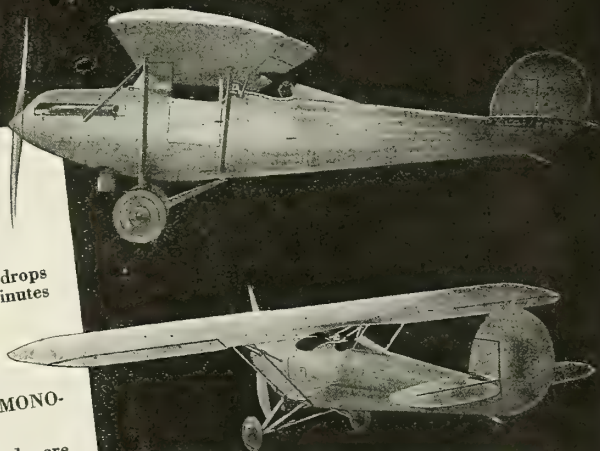
**\$3290**

*Flyaway, Completely Equipped*  
Washington, D. C.

Also available with the  
Wright Whirlwind Engine

*Write for Information*

**BERLINER-JOYCE AIRCRAFT  
CORPORATION**  
ALEXANDRIA, VIRGINIA



**NOW!**

THE BERLINER

## DRAGON

is also available—the same swift and staunch three-place monoplane, powered with **WARNER SCARAB 110 H.P. Engine**, equipped with special **N.A.C.A.** type engine cowlings, completely enclosing the engine, yet achieving a great increase in efficiency, speed and fuel economy.

**\$5850**

*Flyaway, Fully Equipped*  
Washington, D. C.



## WRIGHT PLANE DESIGN COMPETITION

FOR STUDENTS OF THE GUGGENHEIM SCHOOL OF AERONAUTICS

THE Wright Aeronautical Corporation is conducting a contest in airplane design which is open to all senior and graduate students of the Daniel Guggenheim School of Aeronautics, New York University, who have not previously entered for such a design competition.

Drawings and calculations to be entered in this competition must be submitted not later than Saturday morning, May 11, 1929. The winners will be announced not later than July 1, 1929. The prizes will be first prize, \$200.00; second prize, \$125.00; third prize, \$75.00.

Students will not be allowed to work in coöperation with one another. Each design submitted must be the work of only one student.

No design shall be submitted to the judges which does not meet the requirements of the competition as regards information to be presented and the style in which the information is to be presented.

Three copies of the calculations and three sets of drawings are to be presented.

The material submitted must be presented in a neatly typewritten pamphlet (prepared in such form that it may be blue-printed) and drawings of scales indicated. In general, this material should include: (1) statement as to general purpose, main features and design date of the plane, with three-view drawings; (2) weight analysis and tabulations; (3) balance diagram; (4) description of power plant, instruments, and equipment installation, and pilot and passenger accommodation, with special reference to a drawing; (5) performance calculations; (6) longitudinal stability and control calculations; (7) stress analysis in accordance with the requirements of the Department of Commerce; (8) description of structure of airplane with reference to the drawings covering wing assembly, fuselage assembly, chassis assembly, tail surface assembly, and control system; and (9) note on construction of at least two fittings from the point of view of shop practice, and full size drawings.

The design submitted must be for an enclosed cabin airplane, equipped with the Wright Whirlwind five-cylinder R-540 radial engine of 150 horsepower, designed especially for the use of the private owner for personal transportation and sporting purposes.

First safety, and second comfort, should be considered above all. The plane should be easy to fly. The plane may be a monoplane, a biplane, or a triplane, and no restrictions whatsoever are placed on the characteristics of the design. The design must meet the general requirements of the Department of Commerce.

The plane must have an initial rate of climb of 500 feet per minute or better; a minimum gliding speed of not more than 50 miles per hour, and a high speed of at least 100 miles per hour.

The structure of the airplane must be all metal, either steel or duralumin. The covering may be either fabric or duralumin.

The design will be judged according to the following rating:

General utility, safety and excellency of the design .....	20 points
Power plant, instrument, and equipment installation .....	10 points
Pilot and passenger accommodations .....	10 points
Stress analysis and structural design .....	20 points
Stability and control, and calculations .....	10 points
Performance, and performance calculations .....	10 points
Drafting and detail design .....	10 points
Skill and neatness in presentation .....	10 points

The designs submitted in this competition shall remain the property of the student designer. One copy of the material submitted will be reserved for the Daniel Guggenheim School of Aeronautics; and one copy, for the Wright Aeronautical Corporation.

The designs will be submitted to the following judges: Captain E. S. Land, vice president, Daniel Guggenheim Fund for the Promotion of Aeronautics; Mr. Grover C. Loening, president, Loening Aeronautical Engineering Corporation; Mr. C. T. Porter, chief engineer, Keystone Aircraft Corporation.

In case of difference of opinion, or close rating, designs may be submitted to Major C. H. Howard, Army Air Corps; Captain Holden C. Richardson, Bureau of Aeronautics, Navy Department.



Lt. Jimmy Doolittle and Harry F. Guggenheim

## GUGGENHEIM FUND ACTIVITY

"PROBABLY the outstanding aeronautical achievement of 1928 was the demonstration in America by private enterprise that air transport is a profitable business without government subsidy," states Harry F. Guggenheim, president of the Daniel Guggenheim Fund for the Promotion

of Aeronautics, in reviewing the work of the Fund for the past year.

Due to the rush of public trust and capital in the industry, he states that the work of the Fund has changed from molding public sentiment to conducting scientific research and services for aviation. The new work of the Fund includes the safe aircraft competition which is causing great interest, and the town marking campaign which is rapidly progressing. The first adequate weather reporting service, the first fog-flying laboratory, and the first National Safety Conference in Aeronautics, are enterprises recently started by the Fund.

## SCHOOL REQUIREMENTS

TO establish standards for flying schools throughout the country, the Flying School Committee of the Aeronautical Chamber of Commerce has published minimum requirements for pilot training organizations. These include the following: The minimum flying course to receive recognition must qualify the student for the private pilot's license. All flying instructors must hold transport pilot's licenses. The airplanes used in instruction must be licensed by the Department of Commerce. Daily inspection must be enforced. The committee also advises care in the selection of training fields, and carefully accurate advertising.

## AIR MAIL ROUTE TO MEXICO

PAN AMERICAN AIRWAYS, INC., has received the contract for the Brownsville, Texas, to Mexico City air mail route. The service will begin March 9, and the contract runs for ten years.

Although the bid of two dollars per mile made by the Pan American Airways was the highest, that concern was the only one able to meet the requirements of the Mexican postal authorities. The contract calls for one way service seven times a week, and the maximum load must not exceed eight hundred pounds.

## JUPITER PASSES NAVY TEST

GEARED, so that the propeller runs half as fast as the motor, the Bliss Jupiter engine is the first geared airplane power plant to pass successfully all the Navy tests.

The Jupiter was tested for a five-hour period at full throttle at two thousand revolutions under ground conditions. This was followed by a second five-hour period at seventy per cent throttle, and the third five-hour period was at full throttle under conditions of ten thousand feet altitude. The engine was not equipped with a supercharger or blower. At 2,300 revolutions it developed 537 horsepower. Fuel consumption at the cruising speed of 1,780 revolutions was .473 pounds per brake horsepower.

This engine is now under production in the Brooklyn plant of the E. W. Bliss Co., licensees of the Bristol Airplane Co., Ltd., of England.

ANOTHER ONE OF THE 54 AIRCRAFT MANUFACTURERS  
THAT USE **SKF** BEARINGS

## Kimball Aircraft Corporation



Equipped with the highest priced bearing in the world

YOU MAY BUY A  
BEARING AS A  
BARGAIN BUT  
TRY AND GET A  
BARGAIN OUT OF  
USING IT

*for*  
Nothing is apt to cost so much  
as a bearing that cost so little.



## Results Make **SKF** Bearings Permanent Equipment on Vital Locations of "The Beetle" Motor

"WE HAVE been especially pleased with the results attained by the use of **SKF** Bearings and now feel that they are part of our permanent equipment," says the Kimball Aircraft Corporation, builders of "The Beetle," a 7-cylinder, 135 H. P. radial motor. Nine of these bearings are used on every motor as follows: propeller thrust, crankshaft main bearing, camshaft, intermediate drive, starter drive and oil pump shaft.

Dependability in the air, proven not alone by practically all history-making flights but also by commercial, air mail and military planes, was the determining factor in the choice of **SKF** Bearings for "The Beetle." That "the highest priced bearing in the world" is the cheapest in the end is attested through its adoption by the leaders of the aircraft industry for the vitally important locations where reliability is first.

**SKF** INDUSTRIES, INC., 40 East 34th Street, New York, N. Y.

2210

# SKF

## Ball and Roller Bearings



## GOVERNMENT BUREAU ACTIVE IN AIDING AIRCRAFT SALES

*Aeronautics Exports for Five Months of  
1928 Approach Total for 1927*

**A** BUREAU in the Department of Commerce goes quietly about its business of aiding the American aircraft manufacturer to increase his business through the medium of foreign sales. This bureau has long been known to business men in general, but the young aviation industry is just now becoming acquainted with what its trade scouts and Washington headquarters can do for it. This organization, known as the Bureau of Foreign and Domestic Commerce, is a separate unit from the Aeronautics Branch of the Department but cooperates very closely with the latter organization, well known to the aeronautic industry as being under the direction of Assistant Secretary of Commerce, Wm. P. MacCracken, Jr.

During the first five months of 1928, according to figures compiled by the Foreign Aeronautics Section of the Bureau, there were aeronautics products exported valued at \$1,461,328 as compared with a total export value of \$1,903,560 for 1927 which was the record year. Leighton W. Rogers, Chief of the Foreign Aeronautics Section, who is a seasoned air traveler, having flown over most of the European air routes, and who has just returned to Washington after a 6,500 mile trip by air to the west coast, states that every day at least one inquiry comes in from one of the Bureau's foreign offices asking for quotations on American aircraft. These aircraft are desired for use in the far corners of the world. Recently, through the efforts of an American Consul in the field and the Foreign Aeronautics Section, a sale was concluded with a Latin American government for three cabin monoplanes. There are other such opportunities for American aircraft now pending, Mr. Rogers says.

"All that remains to be done in the majority of these cases," Mr. Rogers continued, "is for the bureau to locate a manufacturer who can make deliveries within a reasonable length of time. The time will come, and in the near future, when American manufacturers of airplanes will be glad to get all the foreign business to be had. They should not overlook the fact that the firms that first make entry into a particular market will have a very considerable advantage over those who make no effort to sell abroad now."

There are a number of Commercial Attachés and Trade Commissioners of the Department of Commerce foreign trade bureau who are specializing in the promotion of aircraft sales in foreign countries. These specialists include Trade Commissioner James D. Summers, who maintains headquarters at Panama City and recently completed a tour of South America and will now concentrate his activities to the Caribbean area and the West Coast of South America. Assistant Trade Commissioner J. W. Davis, Jr., of Galveston, Texas, sailed for Rio de Janeiro on August 25, where he will have

his headquarters for the purpose of promoting the sale of American aeronautic products on the East Coast of South America. Both Mr. Summers and Mr. Davis have had considerable experience in aviation, the former having been a member of the first pursuit group and the latter of one of the French escadrilles. Both Summers and Davis were connected also with commercial aeronautics in the United States.

In Australia, a country in which American aircraft is in great favor, but where it cannot now be licensed for commercial use, Assistant Trade Commissioner H. R. Buckley, an American ace in the World War, is carrying on negotiations toward the end that our aircraft can be used there commercially. Commercial Attaché Clayton Lane, at the Warsaw, Poland, office of the Department of Commerce, is a former aviator and has reported some valuable data on the aeronautic situation in Europe. There are men throughout the Bureau of Foreign and Domestic Commerce organization both at home and abroad who are working to aid the American aircraft industry in becoming established in foreign countries. The manner in which this service is accomplished is the same as it has been for other industries, such as the automotive, textile and chemical, which have been exporting for many years. The Bureau maintains twenty-three district offices throughout the United States, and in addition has 43 cooperative offices where the business man can go for answers to his questions on foreign trade practices, market conditions, sales prospects, etc. When a question cannot be answered from the vast amount of pertinent material contained in the files of a particular domestic office, inquiries are directed to Washington, which is in constant touch by radio, cable and the mails with the fifty-three foreign offices and the five hundred or so consular offices of the Department of State, located where the Department of Commerce does not maintain a branch.

## SUMMARY of BULLETINS

OF THE GUGGENHEIM FUND FOR THE PROMOTION OF AERONAUTICS

**T**HE Daniel Guggenheim Fund for the Promotion of Aeronautics is accomplishing excellent work in developing air-mindedness in the United States not only by its gifts of money to educational institutions for the purpose of furthering technical knowledge but also in the publication of many valuable bulletins for the dissemination of information to the general public. Because of the educational value of these bulletins, a summary of their contents is given here for the benefit of AERO DIGEST readers who may obtain copies of same by writing to AERO DIGEST specifying the bulletins in which they are interested.

The Fund has published so far nine bulletins, briefly described as follows:

1. Grants by the Fund to finance study and experiments in aeronautics.

Announcements of the gifts made by the Fund to two California educational institutions for the extension of courses in aero-

nautics and the construction of aeronautical laboratories.

2. Air mail service and the development of Commercial Aviation.

With the gradual withdrawal, at that time, of the Government from the transportation of air mail, the Fund pointed out that public support in the use of air mail would be necessary to make private commercial air mail transportation possible. In turn, this development of the air mail service would promote the growth of the airplane industry in America and of air transportation in all its forms.

3. Aerial Service.

That branch of aviation known as aerial service covers a multitude of uses, such as aerial photography, crop dusting, exploration, map making, etc. The bulletin describes the extent of these services and the importance of this function in American civilization.

4. Safety in Air.

A discussion of the Daniel Guggenheim Safe Aircraft Competition, and the qualities necessary for the safe airplane.

5. The Airplane in the British Empire.

The first published study by the Fund of the uses of the airplane abroad—an analysis of the growth in traffic and services of the Imperial Airways, Ltd., and the regulations covering this form of transport in Great Britain.

6. Aviation on the Continent.

A supplementary study to number 5 dealing with the uses of the airplane in Germany, Holland and Italy. The information for these bulletins is largely secured from the representative of the Guggenheim Fund abroad.

7. Fundamental Principles for Flying School Instruction.

Recognizing that all the improvements in airplane structure and in aviation would be largely lost if a skilled personnel for the operation of the airplane was lacking, the Fund attempted to outline in this bulletin the basic requirements for the training of the skilled pilot. The bulletin, also, has the purpose of counteracting an impression only too readily entertained by many young people in the country that flying was an easy business and required only ten hours or so of instruction.

8. The Opportunities for Trained Mechanics and Pilots in Commercial Aviation.

Because of numerous requests received from individuals regarding training and the demand for mechanics and pilots, the Fund addressed a questionnaire to operators of air transport companies and to aircraft manufacturers to ascertain to what extent a trained personnel was needed and to discover the best methods of supplying it. The results of this are summarized in the bulletin.

9. Celestial Avigation.

Because of the frequency with which position must be determined in the air, and the difficulty of observation, the study of celestial avigation has acquired a new importance. The methods of determining position by relation to celestial bodies are described in the bulletin.

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Here is a remarkable opportunity to  
pick up some practically new equip-  
ment at astonishingly low prices.  
Look over this list.

**3 Ryan Broughams**

**1 Cessna (Whirlwind)**

**3 Curtiss-Robins**

**1 Lockheed-Vega**

**1 International**

**3 Fairchild's FC2**

**1 Set Fairchild Pontoons**

**2 Stinson Seniors**

**1 Stinson Junior**

**1 Eaglerock**

**1 American Eagle-Hisso**

**2 Monocoupes (Velie)**

**3 De Havillands**

**3 Standards J-1**

The above represents the surplus equipment resulting from the consolidation of the various organizations making up the under-signed corporation. This surplus must be disposed of immediately to make room for new, larger equipment now coming in. Here is a chance to secure a cabin or open cockpit job with the initial depreciation wiped out. Quick action is necessary to pick up these bargains. Phone, wire or write today.

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N 327



## WASHINGTON D. C. NEWS

BY WING OVER

AS most persons interested in aeronautics will recall, the White House Spokesman issued a statement last month to the effect that the President was surveying the situation regarding the non-entry of the United States as a signatory to the International Convention for Air Navigation of 1929. Many air-minded folk would like to see this country a party to the Convention if for no other reason than membership in it will enable United States aircraft exporters to sell their products in countries where entry is restricted because of the clause providing that craft from a non-signatory country may not be licensed for commercial use in a signatory nation. Certain advantages in United States membership is also seen by air transport operators extending their services to foreign countries.

Apparently the Department of Commerce does not share the President's viewpoint in its entirety. It has been stated that certain of the terms of the Convention are too rigid, and that if the aeronautics industry of the country is to develop, it should be unhindered by regulations other than those absolutely necessary to insure the greatest possible degree of safety to the users of aircraft. Furthermore, it is felt not only by the Commerce Department, but by the industry at large, that our aeronautic regulations should not be drawn up by persons outside of the United States. Let the industry consider the matter seriously and insist that if we ratify the Convention that certain important reservations be included, which reservations will not permit more rigid and less fair regulation, insofar as domestic operation is concerned, than are now laid down by the Air Commerce Act of 1926.

ON the afternoon of March 5, Bolling Field will be the scene of an exhibition of commercial and military aircraft on the ground and in the air. The part of the program as it now stands, which states that from 12 noon to 1:30 p.m. and from 3:30 to 6:30 p.m. passengers will be taken into the air free of charge, does not seem quite fair to the commercial operators at Hoover Field and Washington Airport who gets \$3 per passenger for a delightful ride over the Capitol, the Washington monument and good portion of the city.

THE District of Columbia Committee of the Senate approved Senator Vandenberg's (Republican from Michigan) resolution to create a special committee for the purpose of studying the National Capital's airport requirements. Even if Congress adopts the resolution, airport legislation will naturally be delayed until the findings of the committee are available. One cannot help but be impressed with the inadequacy of Washington's airports, and it is hoped that something will be done soon toward the establishment of an airport which will be a credit to the capital, for although Washington is not on the important passenger air transport lines scheduled, it is felt that it soon would be if there was a good airport

and passenger terminal. At the present time, it is a sort of cross roads for commercial aircraft. The crowded hangars at the Bolling and Anacostia, joint fields of the Army and Navy, recently housed such important commercial planes as the new Burnelli two-Curtiss Conqueror engine monoplane, the Keystone Patrician piloted by Captain St. Clair Street, a Fokker F-10 piloted by G. E. Haynes and, not least if mentioned last, Colonel Lindbergh and his private Curtiss Falcon.

EACH month there comes an acquisition to Washington's colony of aircraft manufacturer's representatives. These men are not salesmen; they are diplomats *par excellence* who get things done for their principals which could be accomplished by correspondence but not as expeditiously as by personal contact. The latest is Robert Earle, a naval-reserve air officer and ex-commercial flying instructor. Bob is now assistant to Major Burdette S. Wright, who represents the Curtiss interests in Washington. He did some good work while on the staff of the International Aeronautics Conference, as those who remember the banquet at the Mayflower will agree. Bob handled the banquet.

JAMES D. SUMMERS, who, as American Trade Commissioner for Aeronautics to South America, was mentioned and quoted in last month's issue, has resigned from the Bureau of Foreign and Domestic Commerce, Department of Commerce, to accept a position with Pan American Airways, Inc. He will travel South America for the purpose of obtaining permission for his firm to operate over certain countries of the southern continent.

NOW that Colonel Lindbergh will become a benedict soon, something which has been rumored for several weeks stands a much better chance of becoming a fact. The Colonel may want to settle down a bit, so why not in the chair now occupied by the Hon. Wm. P. MacCracken, Assistant Secretary of Commerce for Aeronautics. "Bill," as he doesn't mind being called by new friends—and they are legion—flies about considerable. It's even hard to keep track of him. But with his flying around to choose airport sites, inaugurate them and discuss legislation with the industry, he manages to get things done in Washington. Colonel Lindbergh, if he were interested, would find Bill's job a trying one if for no other reason that the Department of Commerce would be the cynosure of all eyes during "Slim's" incumbency.

MAJOR CLARENCE YOUNG, director of Aeronautics Branch, who has been mentioned as the most logical successor to Mr. MacCracken, pulled a fast one on the newspaper boys. They did not know about the Major's trip to Europe until shortly before the boat sailed. He has with him his Department of Commerce Stearman and Doc Mairment, Wright Whirlwind mechanic, rather than a secretary and a flock of trunks, which shows exceedingly good judgment. By this time, Major Young is flying over Europe

studying air transport from the standpoint of the operator rather than the passenger. According to Department of Commerce records, the Major flew over 400 hours solo last year. He is the only Director of Civil Aeronautics in the world who puts in so much solo time. Something more for the American aeronautics industry to mark up as a record. Perhaps the flying Director can tell us upon his return how we can approach Germany's record in the transportation of passengers by air.

PRESIDENT HOOVER'S inaugural parade will be led up Pennsylvania Avenue to the Capitol on March 4 by sixty airplanes of the Army and Navy.

Thirty-nine observation planes, twelve pursuit planes, and nine bombers will fly at two thousand feet. Then, as the procession moves the planes will lead the way in column formation, flying just high enough to assure safety.

THE Internation Engineering Corporation, a firm specializing in aeronautical and marine layout and design, was recently incorporated in Washington, D. C. This concern will feature aviators' supplies and equipment. The stock will include novel and useful types of air and water craft, iceboats and snow sleds, model airplanes, airplane supplies and parts, seaplane floats, weather forecasting instruments, airport equipment, aviation engine accessories, mechanics' tools, and a complete aeronautical library. The company will also give expert advice on landing field locations and equipment.

## MARYLAND AIR NEWS

BY EDWARD JONES

EFFORTS are under way to have Logan Field, Baltimore, prepared as an air mail field, but several obstacles have been encountered that are holding up the project. Chief of these is the fact that the Maryland Steel Corporation, owner of the property, has increased the annual rental charge from \$2,400 to \$16,000 a year. Another drawback to the plan is the fact that Logan Field is in Baltimore County, and, though the city of Baltimore gets the sole benefit of it, municipal authorities hesitate to spend money for improvements. The reasons are principally political. Improvements needed would cost at least \$20,000.

Apparently the remedy will come with completion of the airport authorized by public vote, plans of which are completed and construction of which will begin in 1929. This plan originally was for an airport ideal, but due to bungling on the part of those who had it in charge, it underwent several changes. Baltimore is determined to have an airport and a good one, and there is much displeasure at the long delays.

AIR mail service from Baltimore to the Eastern Shore has been asked by Eastern Shoremen as a saving of time over the services that steamboats and ferries give,

(Continued on next page)

# The New Travel Air four place Cabin Monoplane

"Just take the wheel at the right, up in front, and fly as easily as you operate your automobile. Turn wheel to the right and the right wing inclines downward; turn wheel to the left and the left wing inclines downward. Push right pedal to turn right and left pedal to turn left. Push steering column forward to nose down—pull it back to nose up. The combination of these operations gives you the desired maneuver.

"All the while the pilot at the other wheel is flying with you—because the two wheels are synchronized and must operate together. Thus the pilot easily and quickly corrects any deviation you might make from the flight path. You are flying while you are learning—no theory,



"Look! She's flying the ship—yet it's her first time in the air.... Dual Control makes this possible."

but actual practice in the air.

"The new Travel Air Cabin Monoplane is inherently stable, and in itself will automatically maintain straight and normal flight. The slightest movement of the controls corrects for any atmospheric variation.

"Soon you will find it unnecessary to employ a pilot for you will have learned to fly—almost without realizing it, because of the dual control—the greatest single advancement ever made

in aircraft construction."

The New 4 place Travel Air Cabin Monoplane is built out of long years of flying experience and is a worthy companion ship to the famous Travel Air 6 place Cabin Monoplane—Type 6000.

Full particulars and The Story of Travel Air on request, which illustrates and describes 9 types of Travel Air Models.



## TRAVEL AIR COMPANY

*The Standard of Aircraft Comparison*

WICHITA, KANSAS



(Washington, D. C., News continued)

since the state is cut in half by the 10-mile-wide Chesapeake Bay, but this project does not look promising.

**MAJOR WILLIAM D. TIPTON**, vice president of the Chesapeake Aircraft Company and commanding officer of the Air Corps, Maryland National Guard, has gone to Miami for a three-month training period with the Pan-American Airways.

Capt. Charles A. Masson, flight commander, is temporarily in command of the national guard unit.

**CAPT. TOWNSEND SCOTT, Jr.**, adjutant of the national guard squadron, has tendered his resignation because of the press of business. Lieut. Ross Cameron has been appointed adjutant in his place.

**MR. RICHARD M. MOCK**, associate engineer of the Bellanca Aircraft Corp., of New Castle, Delaware, recently lectured to the Tome Aviation Club on the airplane and airplane factory operations.

### BALTIMORE AIR NEWS

Berliner-Joyce Incorporated

**WITH** the purchase of a site adjacent to the Baltimore Municipal Airport, the Berliner-Joyce Aircraft Corporation, a new million dollar manufacturing concern, plans to construct a \$250,000 plane factory at once. The plant will employ one hundred men, and will have 50,000 square feet of floor space.

The officers of this concern are: W. W. Moss, president; Temple N. Joyce, vice president in charge of sales; and Henry Berliner, vice president in charge of production. The directors are: W. Frank Roberts, Charles L. Phillips, B. F. Castle, Ralph B. Leonard, and Townsend Scott, Jr. A number of prominent aircraft engineers have joined the staff of the new corporation, namely: Frank S. Hubbard, chief engineer, William Wait, Jr., chief designer; Earl P. Osborn, engineer in charge of structures; and William H. Miller, director of research.

### HAGERSTOWN AIR NEWS

By JOHN C. MIDDLEKAUFF

**HAGERSTOWN** is to become a station on the new air mail route between Baltimore and Pittsburgh. Plans are being made for the establishing of a passenger and freight line between Pittsburgh, Hagerstown and Baltimore.

**THE** Kreider-Reisner Aircraft Corp. is now putting out four models—the C-2, C-3, C-4, and C-5. Several new models are to be built shortly. Challenger planes are being powered with Comet, Warner, Curtiss Challenger, Velie, Wright J-5 and OX-5 engines.

The K.-R.-A. Corp. produced 135 planes last year and expects to double production this year.

The C-4 has been given Approved Type Certificate No. 88 by the Department of Commerce.

Skyways, Inc., of Boston, has the Challenger sales agency for the states of Massa-

chusetts and Maine. Ed. Blue of Chicago has the Illinois district.

Robert Chlasey, of Scottdale, Pa., is the new test pilot and instructor for the Challenger Flying Service.

**THE** Challenger Aviation Club has been organized by the students of the Hagerstown High School. The membership to the club has been limited to 25. Instruction will be given by men from the K-R-A., and pilots from the airport. John C. Middlekauff is president of the club; Lyman Ott, vice president; Kenneth Gassman, secretary; and Charles Gabe, treasurer.

**R. J. STEWART** of Catonsville, Md., has been appointed sales agent for Challengers in Eastern Maryland. He has placed his initial order for 6 planes.

**A** SPEED record for planes flying between Hagerstown and Detroit was made recently when H. C. Hannay, Point Park, Mich., flew his C-4 Challenger to Detroit in 3 hours, 20 minutes.

**TO** help finance the air meet to be held in Hagerstown May 18 to 21st inclusive, an OX-5 Challenger is being raffled off by the Challenger Flying Service.

### VIRGINIA AIR NEWS

By C. N. SNEAD

**E. P. DULING**, a pilot of Roanoke, has just announced plans for taking his entire family on a trans-Atlantic hop sometime this spring. He expects to use a trimotored plane for the ocean venture. The purpose of the flight, he declared is to demonstrate the safety of flying as a fact and not as a theory; to show that the average man may, if he so desires, take his family across the ocean in an airplane.

**JUST** recently under the leadership of Governor Harry Flood Byrd, brother of Commander R. E. Byrd, a program of legislation was prepared and enacted at the last session of the state legislature, to provide for a series of airports at the principal towns and cities throughout Virginia. State aid will be given for the building of these airports, not only in the provision of actual cash under certain conditions, but in making available road machinery for grading and otherwise adapting fields for the landing and take-off of planes. A survey of the state's needs in this respect has been made, and several cities and towns have already completed airports in accordance with the program.

**ROANOKE** now has under consideration several fields in conjunction with its plans to establish a municipal airport by the spring of this year. A Government official who inspected several of the sites will report his recommendations directly to the Department of Commerce. Active work on the airport will be undertaken immediately thereafter, according to council members. There are two privately operated airports at Roanoke at the present time.

**PULASKI** recently completed arrangements for a municipal airport under the state plan, and work has been started on the field. South Boston has an excellent airport already in operation. Danville has a privately operated airport. In addition to several privately operated fields, there is in operation at Richmond the Richard Evelyn Byrd Municipal Airport, headquarters in the state for the Pitcairn air mail lines and Pitcairn aviation school. Winchester also has excellent landing field facilities, as have many of the other smaller towns. Norfolk and Newport News, of course, are well taken care of in this respect.

**FRANK REYNOLDS**, licensed transport pilot of Roanoke, recently was appointed distributor in this section for the Waco planes. For several years, Reynolds has been engaged in passenger hopping and cross-country flights with Roanoke as his operating base.

A Waco-10 was exhibited by Frank Reynolds at the Roanoke automobile show recently.

### FLORIDA AIR NEWS

By JOHNSON WRIGHT

**THE** Curtiss Flying Service, Inc., has a flying school at the Miami Municipal Airport, where complete equipment has been installed for servicing all types of land-planes. A seaplane base, from which training on seaplanes and a general air taxi business is conducted, is located at the north end of Bayfront Park. Sales and distribution of Curtiss products is handled from the general office on Biscayne Boulevard.

At Palm Beach a sales office has been established and a seaplane base is operated. Numerous dealers of Curtiss products have been established, giving the company wide distribution over the state.

The general management of the organization in Florida is under John A. Tuyls. J. R. Waters is sales manager. At the municipal airport, William Van Obrien is manager. C. J. Ekstrom and W. C. Hammond are instructors. John Andre is chief mechanic at the airport.

The Miami seaplane base is in charge of Eddie Niramier, veteran pilot. Harry Smith is another pilot stationed at the base, and J. F. Moore is chief mechanic. The flying equipment at this base consists of two Ireland amphibians and a Sikorsky S-38.

D. S. Van de Water is in charge of the Palm Beach base. B. H. Warburton is salesman, and Lou Gordon is mechanic. The flying equipment at this base consists of two Ireland amphibians.

Robert Gamble of Jacksonville has been named dealer for Curtiss products in the northern portion of the state. Bert Krueger of Stuart has been selected as the dealer for the middle eastern portion.

**PLANS** are being made by the Greater Miami Airport Association and the Miami Aviation Board to hold another air meet in January, 1930. Committees have been appointed to work towards securing the national air races next year, and in event

(Continued on next page)

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(Florida Air News continued)

they are successful, the January meet will not be held.

THE cities of Fort Pierce and Delray Beach, both on a direct airline between Jacksonville and Miami, have painted their respective names and directive arrows on roofs of buildings in the cities.

THE Sarasota municipal airport was recently dedicated with an air show, in which 26 planes participated. The principal event was a stunting exhibition, which was won by Dale (Red) Jackson in a Curtiss-Robin.

Capt. A. F. King and Lieuts. B. A. Glover, L. M. Bawse, J. G. Platt, and E. G. Delaplane from Maxwell Field, Montgomery, Alabama, and Lieut. N. B. Asp from Wright Field, Dayton, Ohio, flew army planes to the dedication.

THE executive committee of the American Bar Association, at a conference held recently in Miami, advocated uniform state laws for aviation.

The executives recommended that no action or approval be given any movement to adopt any uniform state regulations on rates, points of operation, or schedules, since any regulatory action of this kind is now premature. The committee held that an attempt at such regulatory action for service or rates would tend to place the pioneer business in the hands of politically chosen commissions.

The regulation as recommended provides that the vehicle commissioner of each state shall have control of the licensing and inspection of airplanes and pilots and that the state official may promulgate such orders and regulations as do not conflict with other state and Federal laws. He also would be empowered to revoke licenses and to impose fines upon violators of the regulations.

TWO flying clubs have been organized in the Miami High School. One club, with an enrollment of 40, studies the mechanical aspects of flying and is very active in the construction and flying of models. The other club, with 75 members, studies the commercial and industrial side of aviation.

THE City Commission of Miami re-appointed all members of the Aviation

Board to serve another year. This board has control of all aviation matters affecting the city government. The board is composed of J. E. Yonge (chairman), B. B. Freeland, Col. L. E. Goodrich, W. D. Culbertson, R. V. Waters, and Hollis Bush.

CONSTRUCTION of a steel hangar at the municipal airport in Fort Myers is under way and is expected to be completed by April 1st. Facilities for servicing ships at the airport are also being installed. The airport is being operated by the Airways Transport, Inc., a newly organized company.

MIAMI'S first model aircraft flying contest was held February 12th, sponsored by the Miami chapter of the N. A. A. and the city division of parks. Five main events, a world's champion junior balloon race, and a model display comprised the meet.

THE air mail feeder line from Tampa to connect at Daytona Beach with the Miami-New York will be started March 1st, according to officials of Pitcairn Aviation, Inc., operators of the line.

COL. CHARLES A. LINDBERGH inaugurated the air mail line from the United States to Central America when he took off from Miami at 6 a. m. on the morning of February 4th for Belize, British Honduras, on the first lap of a flight to Cristobal, Panama, inaugurating bi-monthly air mail service.

The noted pilot flew a Sikorsky amphibian of the Pan American Airways, for which company he is technical advisor. Harry Lee Buskey, radio operator, and Col. John A. Hambleton, vice president of the airways in charge of operations, were aboard. The mail load totaled 500 pounds.

Lindbergh arrived in Miami February 1st after a flight from New York made in 10 hours and 55 minutes in his Curtiss Falcon. A single stop was made at Jacksonville for fuel.

An overnight stop was made at Belize, and the flight continued to Managua, Nicaragua, on the 5th. The last hop to Cristobal was made on the 6th.

After remaining a few days in Panama, during which he watched the Navy's fleet maneuvers, Col. Lindbergh returned with a load of mail over the same route.

Although the bi-monthly service to Pan-

ama will be for air mail only, Pan American Airways plans to have a daily passenger service through Central American countries to Panama within the next six months.

PASSENGER traffic has so increased that the Pan American has been required to add an additional plane to those regularly scheduled. The Havana Air Special is the name of the new service which leaves Miami at 9:15 a. m. and returns at 5:30 p. m.

FORT PIERCE officially opened its new airport on February 9th. The airport covers an area of 92 acres. Howard Richards, American Eagle dealer in Florida, is operating at the airport.

AN improved type cabin amphibian is being manufactured by the Miami Aircraft Corporation at its factory in Hialeah. The first plane will be ready for flight tests by March 10th. The amphibian is a monoplane to be powered with a Wright Whirlwind. It will seat four passengers and pilot.

Joseph M. Smoot, president of the Miami Jockey Club, is president of the company.

Equipment is being installed in the factory to enable the production of five ships per week.

MIAMI has been selected as the headquarters for the newly created seventh regional district by the Aeronautical Chamber of Commerce of America. The states included in the district are North and South Carolina, Georgia, Alabama, Tennessee, Louisiana, and Florida.

#### Airline Distances From Miami

THE airline distances from Miami to the following cities are:

Florida—Jacksonville, 335 miles; Palm Beach, 66 miles; Key West, 130 miles; Tampa, 204 miles; Fort Myers, 120 miles; Orlando, 204 miles; Lakeland, 190 miles; Pensacola, 522 miles; Tallahassee, 405 miles; Daytona Beach, 240 miles; Ocala, 263 miles; Okeechobee, 109 miles; Punta Gordo, 139 miles; Sebring, 141 miles; Arcadia, 143 miles; Inverness, 247 miles; St. Petersburg, 220 miles.

Cuba—Havana, 237 miles.

Georgia—Atlanta, 622 miles; Savannah, 430 miles; Macon, 520 miles; Americus, 490 miles.

Alabama—Montgomery, 575 miles; Mobile, 570 miles; Birmingham, 650 miles.

South Carolina—Columbia, 565 miles; Greenville, 635 miles.

PAN AMERICAN AIRWAYS INC., reports 772 passengers and fifteen tons of mail carried by its trimotored airliners in flying 73,000 miles between Miami, Havana, and the other cities of the five nations served on the Central American routes, during the first thirty days of operation. The fourth route of Pan American Airways will begin operation as soon as it is reported on by the company's technical advisor, Col. Charles A. Lindbergh, who recently inaugurated the service.



The "Los Angeles" pays a visit to Miami, Fla.

Photo Hamilton Wright

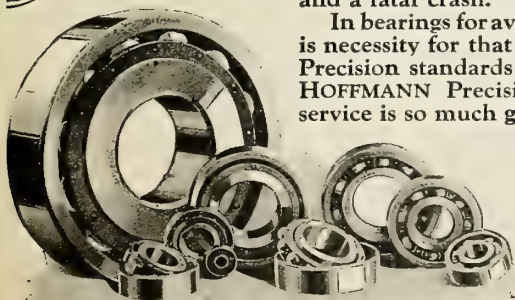


*Monument Erected to the  
Memory of Georges Guynemer  
by his Belgian Comrades.*

## Plain Talks on Fine Bearings

No. 4—"A hair"—saith Omar—"divides the false and true." But a unit of measurement only the smallest fraction of a hair's breadth may, in one bearing in an airplane, mark the difference between a successful flight and a fatal crash.

In bearings for aviation service, above all others, there is necessity for that super-serviceability dictated by the Precision standards inflexibly maintained in NORMA-HOFFMANN Precision Bearings. "The difference in service is so much greater than the difference in price."



**NORMA-HOFFMANN  
BEARINGS CORPORATION**

Stamford — Connecticut

PRECISION BALL, ROLLER AND THRUST BEARINGS

M 72



## NEW YORK AIR NEWS

**T**HE Curtiss Aeroplane and Motor Company has promoted Mr. Jules Piccard to the managership of its structures section, and Mr. Robert E. Johnson to the position of chief of the aerodynamics section.

Mr. Piccard is a graduate of the Polytechnic Institute of Brooklyn. He has been with the Curtiss company since 1926. Mr. Johnson is a graduate of Worcester Polytechnic Institute. A year ago he was placed in charge of the wind tunnel.

These vacancies occurred at the resignations of Mr. F. S. Hubbard and Mr. William H. Miller to join the newly formed Joyce-Berliner Aircraft Co. of Baltimore.

**T**HOMAS A. MORGAN was recently elected president of the Sperry Gyroscope Co., Inc., Brooklyn, which has, by the application of the gyroscopic principle, given much aid to the stabilization and control problems of the naval, military and aeronautical fields. The other officers of the Sperry Gyroscope Company are: R. E. Gillmor, vice president and sales manager; Capt. Thomas B. Doe, vice president and treasurer; H. H. Thompson, secretary; and O. H. Rughaase, assistant treasurer.

**I**STRUMENTS of the Consolidated Instrument Company of America are now standard equipment on Waco and Husky planes built by the Advance Aircraft Co., of Troy, Ohio, and the Consolidated Aircraft Co., of Buffalo, respectively.

The equipment to be furnished for these two companies includes temperature and oil pressure gauges, altimeters, compasses, and tachometers.

**F**OURTEEN new weather stations to observe and correlate a state map of weather conditions twice daily for aviation purposes is the recommendation of the New York State legislative committee on aviation. These reports will be broadcast twice daily by the National Broadcasting Company and the General Electric Co. The additional stations would be located at Elmira, Glens Falls, Hornell, Jamestown, Lake Placid, Little Falls, Malone, Middletown, Olean, Oneonta, Plattsburg, Poughkeepsie, Ticonderoga, and Watertown.

**F**LYING more than two hundred hours in four months in instruction work, the New Rochelle Flying Club, Inc., of New Rochelle has completed a most successful season of training. Several members have soloed in the club's new Eaglerock under the club's instructor, Capt. Peter Babanenko.

**H**ORNELL AIRWAYS, INC., the flying club of Hornell, N. Y., has recently purchased a site for an airport three miles north of the city of Hornell, which will be in operation by June. The club plans to erect a Hornell City Airport, and will begin construction as soon as weather permits.

**G**ATES Aircraft Corporation of Delaware and the Gates Flying Service of New York are new concerns formed by Ivan R. Gates to manufacture airplanes and conduct airlines, flying schools, and service stations.

**T**HE Consolidated Instrument Company of America, Inc., has received orders amounting to more than 350 complete airplane navigational instrument boards from three major airplane manufacturers. The orders were from the Curtiss-Robertson Aircraft Manufacturing Co., Command-Aire, Inc., and the General Aircraft Co., of Buffalo.

The boards for the Curtiss-Robertson concern are to be used on the new Curtiss-Robin planes.

**W**ILLIAM H. MALLON CO., INC., consulting engineering firm, has added Mr. Eugene Cannava, architectural engineer, to its staff to further the designing of aviation buildings.

**A**T the annual meeting of the stockholders of Valentine & Company, held recently in New York City, the following officers were elected:

Mr. N. T. Pulsifer, chairman of the executive committee; Mr. A. L. Phillips, chairman of the board; Mr. Lawson Valentine Pulsifer, president; Mr. O. A. Hasse, executive vice president; Mr. Langdon B. Valentine, vice president; Mr. Lawrence Phillips, vice president and treasurer; Mr. L. H. Roper, assistant treasurer; and Mr. L. A. Osborne, secretary.

**T**HE International Nickel Company, Inc., New York City, has issued a 12-page illustrated booklet on the Curtiss D-12 and Conqueror engines and their use of nickel alloy steel. The booklet includes performance characteristics and important features of design of these water-cooled engines, as well as the essential specifications and a discussion of the material used in their construction.

**T**HAT winter weather does not affect airplane sales is the belief expressed by the General Aviation Co., of Syracuse, N. Y., in reporting on its sales for the month of January. Thirty-five Stinson-Detroiters, Stinson Juniors, and Command-Aires, were sold in the up-state district during the month.

With the next carload of Command-Aires this firm will display the planes in Syracuse and in Elmira, where it manages and operates the airport. A semi-weekly passenger service will then be inaugurated between these cities.

**E**LSIE CAMPBELL FERGUSON is the only woman member of the Sunrise Flying Club of Long Island. Miss Ferguson is corresponding secretary for the Sunrise Flying Club, and is now organizing a junior branch of that club for high school boys and girls. In this work she conducted a model plane contest in several Long Island theaters.

### S. A. E. Aeronautic Divisions

**A**ERONAUTIC divisions of the Society of Automotive Engineers have been formed by New York City, Detroit, and Chicago branches of that organization.

**C**HARLES J. ERNEST recently joined the air transport engineering firm of Black and Bigelow as architect.

**M**OHAWK Pinto airplanes will be distributed henceforth in the New York metropolitan area by the Seaboard Aircraft Corporation. This firm has recently been appointed distributors for the Mohawk Aircraft Corporation of Minneapolis, Minn.

(Continued on next page)



Progress Dinner of the United Business Interests to the Aviation Industry, under the auspices of the Exchange Club.

# ACCURACY.....

Aviators' Post No. 743



American Legion

JOHN DWIGHT SULLIVAN, Commander  
140 Nassau St., New York City.

Feb. 19, 1929

Air Associates, Inc.,  
535 Fifth Avenue,  
New York, N.Y.

Gentlemen:

I wish to thank you and compliment your organization on my own behalf and that of the Post Exposition Executive Committee on the ACCURACY and speed with which you rigged and serviced the greater part of the representatives' airplanes at the New York Show, Grand Central Palace, February 6th to 13th, conducted under the auspices of the Post.

I know I also express the appreciation of the individual exhibitors who chose your service.

Cordially yours,

*John Dwight Sullivan*

JOHN DWIGHT SULLIVAN,

Post Commander.

**T**HE following airplanes were rigged and serviced by Air Associates' mechanical staff at the New York Aviation Show:

Savoia Marchetti 62	Whittlesey Avian
Kitty Hawk	Cirrus Avian
Bellanca CH	Spartan
Lockheed "Vega"	Buhl Senior Airedan
Lockheed "Air Express"	Travel Air Monoplane
Avro Avian	Cessna Monoplane



**AIR ASSOCIATES, INC.**

Curtiss Field, New York

(In April: Chicago Municipal Airport)





(New York Air News continued)

Maintaining offices in New York City, the new distributors have temporary hangars and a demonstrator at Curtiss Field, Long Island. The personnel of the concern includes Emil Burgin, chief pilot, Paul P. Bartner, in charge of maintenance, and Arthur K. Ransom, manager.

**BARBER & BALDWIN, INC.**, of New York has announced that Rule and Sons, Inc., of Los Angeles, has been appointed general agent for the Aero Insurance Company and the Aero Indemnity Company for the state of California.

**THOMAS T. HILDEBRANDT** has become associated with Commercial Investment Trust, Inc., of New York City, as manager of the aeronautical division.

Mr. Hildebrandt was one of the original delegates at the founding of the National Aeronautic Association in Detroit in 1923.

**CHARLES D. STEARNS** has been appointed traffic manager for the entire line operated by Canadian Colonial Airways. His headquarters will be in Montreal.

**AIR ASSOCIATES, INC.**, announces the appointment of Frederick W. Peel, as service manager in charge of engine overhaul and plane maintenance, at its field branches at the Chicago Municipal Airport, Curtiss Field, Long Island, and, in the late spring, at the Newark Municipal Airport.

Mr. Peel has just left the Stout Metal Airplane Co., division of the Ford Motor Company, where he was in charge of production and maintenance of the trimotored metal planes.

**REALIZING** the need of better appearing structures in the aeronautical industry to convince the public of the stability of aviation, the Fairchild Aviation Corporation selected their latest hangar with great care. This hangar is located on Fairchild's own flying field, across from the manufacturing plant, and the architectural treatment of the hangar is made to harmonize with that of the plant itself.

The hangar is of steel frame construction, brick walls, "round the corner" doors, with a clear span of eighty feet, and one hundred sixty-five feet long. It was designed and built by the Austin Company.



Miss Elinor Smith, who flew continuously for 13 hours 17 minutes in a Bird biplane.

**THE** Fairchild Aviation Corporation will move into new offices in March on the forty-eighth floor of the new Chanin Building, New York City.

**THE** Moto Meter Company of Long Island City has perfected a special air gauge for low pressure airplane tires. A more accurate measuring of pressure will prevent blow outs in sudden temperature changes.

## BUFFALO AIR SHOW

**THE** general committee of the Buffalo Aviation Show, under the leadership of Major John M. Satterfield, announces that six new planes are already signed up to make their first appearance before the American public at Buffalo from March 23 to 30.

These planes are the General Surveyor, a twin-motor photographic plane of new design, made by the General Airplanes Corporation; Consolidated Fleet, made by the Consolidated Aircraft Corporation, and named for Major R. H. Fleet, president; Ta-Ho-Ma biplane; the Curtiss Thrush, made by the Curtiss Aeroplane and Motor Co.; and two models of the Savoia-Marchetti amphibian, a six-place seaplane, and a three-place "baby amphibian."

All planes will be hauled to and from the freight depot or airport at the expense of the show, and electric light outlets will be furnished without charge.

**ARTHUR C. WARREN** has joined Air Associates, Inc., as director of airplane sales. Mr. Warren, who was at one time an automobile racer, was formerly associated with the Wright-Martin Aircraft Corporation.

## Congratulations

**J. VON DER HEYDEN**, formerly in charge of the aviation division of the Kendall Refining Company, has established a business of his own in collaboration with his father, Ludwig Von der Heyden. The new company is known as the Hy-Vis Motor Oil Co., Inc., and its headquarters will be in New York City.

**COLONIAL WESTERN AIRWAYS** have obtained a long time lease from the Schenectady Municipal Airport for the purpose of establishing a repair and maintenance depot. Schenectady is one of the five stops on the Colonial Western Airways route between Albany and Cleveland.

**COASTAL AIRWAYS**, recognizing the future need of seaplanes for use in the New York metropolitan area, will start a seaplane flying school. The school will use Fairchild Model 215 on pontoons. The operation of a seaplane transportation route and the sale of Fairchild planes will be additional activities of the new concern.

Next summer Coastal Airways will operate planes from the North River to Albany, Atlantic City, and Coney Island.

**AVIATION CREDIT CORPORATION** is the first financing concern to encourage airplane sales by a time payment plan. The organization, recently formed with a capital of \$5,000,000, will be headed by Howard L. Wynegar as president.

**AT** the meeting of the American Society of Mechanical Engineers in New York City, February 8th, Col. S. S. Hanks, of the American Airport Corporation, spoke on European aviation, J. C. Worthington, of Black & Bigelow, discussed the engineering aspects of airport construction, and John Bonforte, of the Bonforte Airport Engineering Co., related some facts regarding the selection of airport sites and airways.

**H. A. BAKER** of Schenectady has been appointed as service manager of the International General Electric Company, with headquarters in New York City.

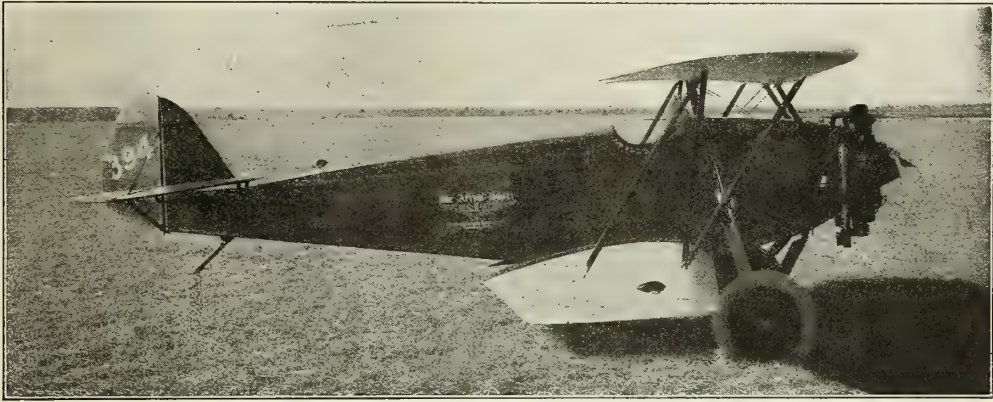
**C. W. WEBSTER**, head of the Curtiss Aeroplane Export Corporation of Garden City, L. I., plans to introduce the light Curtiss-Reid Rambler planes and equipment for student training into South America shortly. The planes are manufactured in Montreal.

**ELECTION** of Edward L. Fries, formerly of the Ajax Rubber Company, to the board of directors of the Curtiss Flying Service, Inc., as vice-president in charge of business administration, was recently announced.



New steel hangar of the Fairchild Aviation Corporation, at Farmingdale, L. I.

# THE ARROW SPORT



**T**HE reception given the Arrow Sport at the New York Show was remarkably enthusiastic. Never before, on the eastern coast, has a ship been praised so highly.

The best eastern pilots tested the Arrow Sport and all made the same comment, "The non-spinning qualities in the Arrow are the best of any ship I have ever flown."

For school work, the Arrow Sport cannot be surpassed. For business and sport, it is the best investment on the market today.

Eastern Arrow Aircraft Corp., 5 East 57th St., New York—New York, Pennsylvania and New England States distributor.

## Arrow Aircraft and Motors Corporation



**Havelock, Nebraska**

*Some desirable territory open, please give references when writing.*



## ALBANY AIR NEWS

By H. F. Wood

**S**EVENTY-FOUR cities and towns in the state already are marked for identification from the air, and ninety more are planning to do so in the immediate future. The aviation committee of the state legislature is conferring now with the Empire State Gas and Electric Association concerning placing obstruction lights on all high tension wires adjacent to or crossing state airways.

Five state airways are designated by the committee. They are Albany-Buffalo, New York-Montreal, New York-Buffalo via Binghamton, Elmira and Olean; Elmira-Plattsburgh via Syracuse, Watertown and Potsdam, and Albany-Binghamton.

The committee also recommended the publication of a yearly "Blue Book" for the guidance of aviators, patterned after the automobile "Blue Book" now in use.

**G**OVERNOR FRANKLIN D. ROOSEVELT will confer shortly with F. Trubee Davison, Assistant Secretary of War for Aeronautics, on a constructive and continuous aviation program to be adopted by the state in harmony with military plans. This move is contemplated so that commercial aviation development may go forward in close coöperation with the future needs of the Army in its preparedness program.

Governor Roosevelt also has declared that he favors making New York state air traffic regulations uniform with those of other states.

**C**OLONIAL WESTERN AIRWAYS announce that negotiations have been completed for a long term lease at the Schenectady airport and that plans are being formed for the establishment of a repair and maintenance depot there.

**M**APPING of the New York-Albany-Montreal airway has been started by the Coast and Geodetic Survey at Washington, according to announcement by Raymond L. Ross, chief of the mapping divi-

sion. Strip maps, each covering a section 80 miles wide and from 200 to 400 miles long, will be prepared. The Albany-Buffalo route is to be mapped later.

**"CY"** BITTNER of Syracuse and C. W. Maris of Canton, O., have been added to the piloting staff of Colonial Western Airways, operating between Albany and Cleveland. E. E. Basham, formerly pilot on the regular run, is now in charge of operations at the Cleveland terminal.

## CENTRAL NEW YORK

By MILDRED MARVIN

**A**PPPOINTMENT of Gordon K. Hood, manager of the Syracuse Municipal Airport, as general manager of the Central New York district of the Curtiss Flying Service, Inc., was announced recently.

The erection of a \$40,000 hangar at the municipal airport is being planned by the Curtiss company, which has designated Syracuse as headquarters for its Central New York branch. Work on the hangar will be started in the spring it is expected. The Syracuse branch will operate an aerial taxi service, a pilot's training school and will maintain a sales office.

The Central New York district will extend north to the St. Lawrence River, east to Schenectady, south to Elmira and Binghamton and west to Geneva.

It is expected the Curtiss branch will be in full operation in March.

**T**HE General Aviation Company, Inc., of Syracuse, received a carload of Command-Aire biplanes at the municipal airport recently.

**T**HE first Syracuse made airplane, which was sold recently, is a three-place Homer monoplane made by the Hogan-Mayer Aircraft Corp. It is powered with an 80 horsepower Anzani motor.

**E**RNIE B. HANNON, Central New York agent for Wacos, received a carload of latest model Wacos recently.

## Binghamton Notes

By John B. G. Babcock

**M**ORE than a score of young men have enrolled as members of the new Binghamton Flyers Club, formed February 5. The club has its headquarters in the American Legion clubhouse. Officers of the new club are: president, Harry Hubbard; vice president, Richard S. Lusk; secretary, Leon S. Palmatier; and treasurer, A. R. Wilbur.

**T**HE new addition to the plant of the Scintilla Magneto Co., at Sidney, N. Y., 38 miles north of Binghamton, is virtually complete and will provide 40,000 square feet more of floor space. Completion of this addition will increase production capacity at the plant from the present 1,200 units monthly to 2,000.

The 450 employees at the Sidney plant now are working overtime in an endeavor to supply the demand.

The new factory, of brick and steel, and strictly fireproof, is thoroughly modern in design. It will be equipped with the most up-to-date machinery.

**T**HE Binghamton Aero Club has been reorganized and has obtained 25 new members. These men last week formed the Binghamton Flyers Club, which has now amalgamated with the Aero Club. The club plans to try again to arouse city officials to the need for an airport here. All that is now available for local and visiting fliers are two landing fields, one at West Endicott, owned by the Endicott-Johnson Corporation, and the other a field leased by Richard L. Bennett. Colonial Western Airways, Inc., which has the privilege of using the West Endicott field, will probably inaugurate a passenger, mail and express service at the field early this spring, routing its planes on a direct line from Buffalo to New York City, thereby effecting a saving of 100 miles over its present route between those cities. The Colonial concern may erect a hangar and other facilities at the West Endicott field, but no definite announcement has been made.

(Continued on next page)

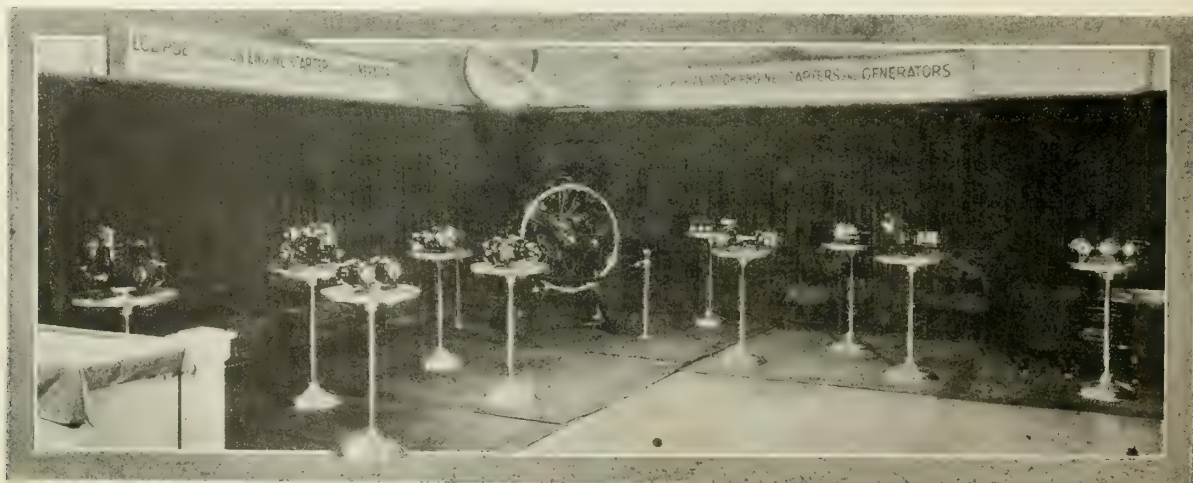
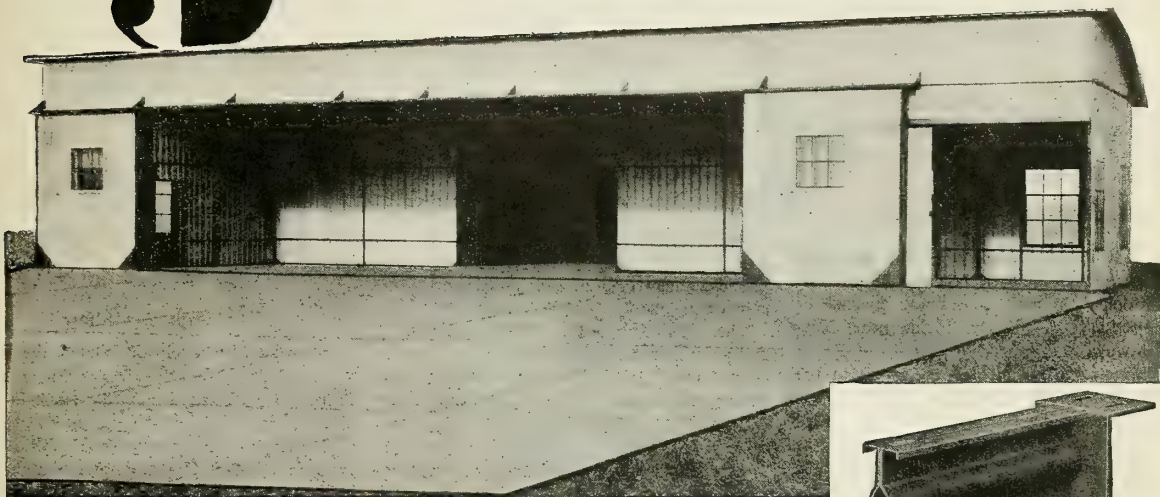


Exhibit of the Eclipse Machine Company at the New York Aviation Show.

# 3 IN ONE

Photo is of Dr. Walter Cross' 3 in one Butler Ready Made Hangar. Dr. Cross is a nationally prominent chemist using his plane between his various testing laboratories.



## INDIVIDUAL HANGAR MOTOR CAR GARAGE PRIVATE OFFICE OR CLUB ROOM



### MODELS IN PRODUCTION

Three place open. Four place cabin.

### POWER UNITS

Designed for installation of J-5 AB Wright Whirlwind, 200 H.P. motor. Other power units may be installed.

### LOADING

Normal pay load, two passengers and baggage, 400 to 500 pounds. Gross weight 2650 lbs. Power loading (J-5 AB) 13.25 lbs. per H.P. Wing loading 8.06 lbs. per sq. ft.

### DIMENSIONS

Wing span—upper 34 ft., lower 30 ft. Total wing area 310 sq. ft. Overall length 24 ft. 6 in. Maximum height 10 ft. Wheel tread 7 ft. 6 in.

### PERFORMANCE DATA

(Conservative with full load)

Maximum speed 130 M.P.H. Landing speed 42 M.P.H. Rate of climb at sea level 1400 ft. per min. Service ceiling 14,000 ft. Cruising speed 1600 R.P.M. 110 M.P.H.

### FUEL DATA

Gasoline capacity upper wing 40 gal., fuselage 30 gal., total 70 gallons. Gravity feed through 1/2-inch lines. Oil capacity 8 gallons.

BUTLER AIRCRAFT CORPORATION  
KANSAS CITY, MO.



FOR your motor car while you are flying—for your ship while you are motoring—for all three of you between times—here is protection against the elements—against fire—against tampering. It is truly a home port all your own.

Roll back the steel doors and it is only a matter of moments to get going on the highway or into the air. Plenty of room for tools in the garage and the third compartment is variously utilized for office, club room or tool room. An ideal air station for transport lines.

Butler Ready Made Hangars are quickly erected and may be taken down unit by unit for moving to new locations without danger or loss of anything more than a few dropped bolts. Yet permanency is one of their out-standing characteristics. Sizes range from the smallest individual type to the enormous airport types, which are familiar landmarks at many landing fields. Hangar Booklet 75 and Butler engineering service will supply you with all the additional information you need—including prices, if you will mention the size building needed.

BUTLER MANUFACTURING  
COMPANY

1204 Eastern Ave., Kansas City, Mo.  
904 6th Ave., S. E., Minneapolis, Minn.



In Butler Ready Made Industrial buildings the structural purlins are a combination of tubular and I-beam design, giving the maximum strength attainable per pound of steel.

In all Butler Ready Made buildings, the galvanized steel wall and roof sections are stiffened with deeply drawn corrugations, on 8-inch centers, giving a neat paneled effect.

# BUTLER

## READY-MADE HANGARS



(New York Air News continued)  
nouncement has been made as yet regarding the company's plans.

**L**IEUT. CAMERON T. ROBERTSON has resigned from the piloting staff of Canadian Colonial Airways to enter the employ of National Air Transport. His run has been taken over by Frank J. Ambrose, former reserve pilot.

**I**N its annual report to the New York state legislature, the public service commission has asked that it be granted the same powers over air traffic that it possesses over other methods of transportation.

## NEW JERSEY AIR NEWS

**E**FFECTIVE February 17, the municipal airport at Newark became the base of operations for mail contractors instead of the airport at Hadley Field, near New Brunswick.

This change is made as the result of the announced policy of the Post Office Department that air mail fields should be located as close to large commercial centers as possible with a view to the saving of time in both the receipt and delivery of mail.

**C**ENTRAL AIRPORT, between Philadelphia and Camden, is growing as the first construction work begins. All work on the airport will be completed by June 1, according to schedule. Mr. Walter S. French of Moorestown, himself a pilot, is doing the grading; the Airport Development and Construction Company will erect the buildings.

Requests for hangar space requiring seven 60 x 100 foot hangars have been received already, and the plans have been doubled. Two passenger lines have requested use of the field when open.

**A**ERICAN CIRRUSS ENGINES, INC., was installed in its factory at Belleville, production was begun, and bids were being received one month after incorporation, according to Allan E. Hoffman, vice-president. The newly organized concern will be manufacturing the Cirrus Mark III on a production basis at a rate of five engines a day by the last of March. It is a four-cylinder-in-line vertical air-cooled motor, having a normal output of eighty-eight horsepower at 1,900 revolutions per minute.

**A**N order of \$2,400,000 for 350 airplane engines recently went to the Wright Aeronautical Corporation and the Pratt and Whitney Aircraft Co., from the Fokker Aircraft Corporation. The contract calls for the delivery of two hundred engines of 425 horsepower and 150 of 525 horsepower to the Fokker concern this year.

**L**ADY MARY HEATH has been appointed aeronautical adviser to the American Cirrus Engines, Inc., of Belleville, N. J. Lady Heath has used the Cirrus engine in all her flights, and is the only woman holder of an aviation mechanic's license.

## New Standard Planes Receive Approved Type Certificates

**T**HE Aeronautical Branch of the Department of Commerce recently issued four Class A Approved Type Certificates to Charles Healy Day, chief engineer and vice president of the New Standard Aircraft Corporation, Paterson, N. J.

The planes for which the certificates were issued are as follows: The New Standard Model D-24 is a five-place Hispano-Suiza motored sesquiplane carrying a useful load of 1,334 pounds, a pay load of 790 pounds, and having a gross weight of 3,400 pounds. Certificate No. 107.

Type Certificate No. 108 was awarded to New Standard Model D-25, which is also a five-place sesquiplane, but which is powered with a J-5 Wright Whirlwind engine. It will carry a useful load of 1,390 pounds, a pay load of 810 pounds, and has a gross weight of 3,400 pounds.

The New Standard combination air mail and passenger carrier, which has an air mail compartment and a compartment for two passengers besides the pilot, is known as Model D-26. This plane is also powered with a J-5 Wright Whirlwind and has the same useful load, pay load and gross weight status as Model D-25. Certificate No. 109.

New Standard Model D-27, bearing the government approval number 110, is a J-5 Wright Whirlwind motored plane used for cargo carrying. It is a single-place ship. The pay load, useful load and gross weight of this model is also identical to that of Model D-25.

## PENNSYLVANIA NEWS

### Pitcairn-Autogiro Company

**P**ITCAIRN-CIERVA Autogiro Company of America is a newly organized concern controlling the rights to manufacture the autogiro in America. Harold F. Pitcairn, president of Pitcairn Aviation, Inc., will head the new firm, and Pitcairn engineers will aid in the manufacturing problems of the new aircraft.

When the autogiro was first tested in America at Pitcairn Field, the "windmill" attracted much comment. The autogiro is the invention of Juan de la Cierva, a Spaniard. It has been demonstrated quite successfully in Europe.

**T**HE Bonney Forge and Tool Works have placed a large airport identification arrow on the roof of their Allentown building. The Guggenheim Fund sent the Bonney concern a certificate of appreciation for their act.

**M**CKNIGHT, ROBINSON AND COMPANY, INC., Pittsburgh advertising agency, has added to its staff as manager of the aviation division Mr. W. R. Yahner, former Aviation editor of the *Pittsburgh Press*.

**W.** G. TREIBER, airport lighting specialist, has been recently promoted to the post of general sales manager for the B. B.

T. Corporation of America, Philadelphia. Mr. Treiber has been with this concern for several years as an airport specialist.

**A**NDREW WELLS ROBERTSON of Pittsburgh, president of the Philadelphia Company, was recently elected chairman of the board of directors of the Westinghouse Electric and Manufacturing Company.

Henry Bedinger Rust, president of the Koppers Company, was elected a director of the Westinghouse company at the same meeting.

Since the death of Mr. Guy E. Tripp in 1927, the chairmanship of the board has been temporarily held by Paul D. Cravath, general counsel of the Westinghouse company.

### Pittsburgh Air Show

**T**O make Pittsburgh air-minded, the First Annual Pittsburgh Aircraft Show from March 9 to 16 will display the latest in airplane design, and will be the meeting place of Pittsburgh's aviation leaders. The Pennsylvania Aircraft Operators Association will hold a convention, and take action to insure future state laws which will be favorable to the industry.

More than twenty planes have been entered in the show and others are expected to reserve space before the exhibition opens. The planes range in size from trimotored transports to small one-place sport planes. There will also be a large number of five, three and two-passenger commercial and private planes. Other exhibitors include manufacturers of a variety of parts used in airplane construction.

**T**O apply intelligent business sense and engineering methods to the development, design, and construction of airports, the Airport Development and Construction Company has been formed in Philadelphia, incorporating an organization which will handle every phase of airport work. Included in its personnel will be landscape architects and designers.

The concern is at present operating in the construction of three air fields: Airview Flying Service, Red Bank, N. J.; Philadelphia Main Line Airport at Paoli, Pa.; and Central Airport at Camden, N. J.

The officers of the firm are: Mr. R. E. Lenton, president; Mr. G. William Glose, vice-president; and Mr. William A. Hemphill, chief engineer.

**A**S a new addition to wearing apparel for comfort in flying and boating, the Utility Garment Corporation of Philadelphia announces Ute, an all-weather suit. Made waterproof with rubber vulcanized between two layers of cloth, the suit covers the entire body, except the face, hands, and feet. It weighs thirty-five ounces.

**T**HE Bliss Jupiter engine recently passed the tests of the Navy Department, having developed 537 horsepower at 2300 revolutions per minute.

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**A** new type of leadership and preparedness for the job is swiftly looming up in the world of aeronautics. Smart precision in the handling of aviation affairs emphasizes the trend of today. Make your "take off" into the air service with an organization enthusiastically devoted to this objective. Graduate from a highly recognized air college, a competent, thoroughly schooled pilot. Fly in wonderful equipment—American Eagle Biplanes, Cessna Monoplanes and Lincoln-Page Biplanes. Fly ships powered with the famous Wright Motors. Get right into the work with enthusiastic, competent instructors. Consolidated Air College offers you advantages unequalled in the United States. The recog-



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Vice-President and General Manager  
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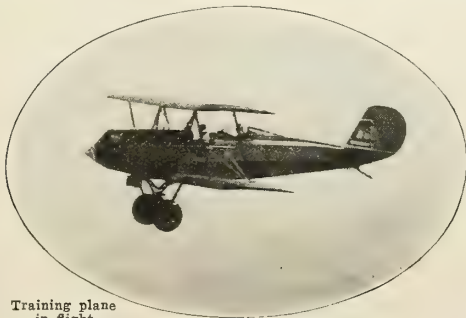
nized Rankin System of teaching is used. Every detail covered, including theory of flight, practical flying, motor overhauling, construction and installation, structures and rigging, navigation, meteorology, etc. A new course in parachute now added. The most thorough, complete instruction available. Learning aviation at Consolidated Air College insures you chance for an enviable position upon completion of course. Situated in the best flying territory in the country. Sit down right now and fill out the coupon, and get full information about this remarkable air college. Find how you can qualify for a pilot's license and a high paying income from aviation. Sign the coupon now!

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## TEXAS AIR NEWS

**A**IRPORT facilities on a 200-acre landing field are to be developed at Snyder, Scurry County. This \$50,000 airport is made possible through the generosity of Mr. D. P. Yoder, a local resident.

**M**R. W. L. EDWARDS, owner of the new Edwards Airport, six miles from the center of Houston, has awarded the contract for a new Notrus hangar, 102 by 100 feet. This will be another step in completing this 200-acre airport which now has one Class B type hangar, filling station, and work shop in operation. Mr. Edwards also plans to erect individual hangars.

## FORT WORTH AIR NEWS

By CAPT. W. H. SCOTT

**A**CCORDING to D. W. Carlton, aviation secretary of the association of commerce, at least three airplane manufacturing firms will be located at Meacham Field, which will also be the terminus for several airlines.

**A**NNOUNCEMENT was also made that Fort Worth would be the terminus of the new airline that will operate between Fort Worth, Dallas, Oklahoma City, Tulsa, and St. Louis. The new airline will have a capital of \$1,000,000, and Earle P. Halliburton of the Halliburton Oil Company is president.

**A**PROPOSED new air mail route between Atlanta and Los Angeles will materialize within the next few months with Fort Worth as the converging point and transfer center for north and south air mail, according to J. Roby Penn, chairman of the aviation committee of the association of commerce.

**L**UBBOCK will have a new class A airfield to cope with expected air traffic over the T. A. T. and other lines that will pass over the city, according to Henry L. Allen, president of the board of development at Lubbock. George A. Benson is chairman of the airport committee.

**S**WEETWATER will have a new airport under Class A by March 1. The city has bought 220 acres of unobstructed land and an option on another 240 acres close by. Plans contemplate the building of a new hangar and concrete runways.

**T**HE second examination for rating in the Aviation Cadets of America at Fort Worth was conducted by Major F. H. Blake at the association of commerce. The subjects were history of aviation, parts of a plane, Morse code, history of the flag and first aid.

**T**HE Texas Flying Service has been incorporated here, with Seth Barwise, president; Henry Woods, chief pilot and vice president, and William Stoorza, secretary-treasurer. The company's first business was a survey of a new road from Fort

Worth to Jackboro, Texas. The company will enter the cross-country, aerial survey, and flying instruction business.

**T**HE first Texas Air Exposition will take place during the Fort Worth Stock Show, to be held here March 9 to 16, under the auspices of the aviation committee of the association of commerce. There will be a large showing of planes, engines and equipment.

## WEST TEXAS NEWS

By MILLARD COPE

**I**N the near future William F. Centner, of the engineering corps, Department of Commerce, will visit Denison by air. An attempt is to be made while he is in the city to hold a meeting of interested Denison citizens, relative to carrying out plans for completing the municipal airport.

**C**OMMERCIAL aviation will be one of the principal topics on the program of the annual convention of the West Texas Chamber of Commerce, May 13, 14 and 15.

The aviation committee of the West Texas Chamber of Commerce recently held its first meeting, electing Max Bentley, Abilene, as chairman, and Herschel M. Colbert, Sweetwater, as secretary. Other members of the committee include Ernest Tucker of San Angelo, Leon Sheld of Coleman, M. K. Berry of Vernon, George E. Benson of Lubbock, F. R. King of Big Spring, J. E. Hill of Amarillo, and Karl E. Wallace of Coleman.

This committee is largely responsible for a bill now before the House in the Texas Legislature, providing that air regulations in Texas conform to Federal regulations. The bill would also place regulations of airplane operation within the borders of the state under jurisdiction of the state railroad commission.

**T**HE Business Men's Club of Big Spring, at a recent meeting, demanded immediate attention on an airport project being considered by the chamber of commerce.

Approximately \$26,000 has been pledged toward the \$50,000 needed to provide Big Spring with airport facilities.

**A** 160-ACRE tract of land three and a half miles east of Colorado, Texas, has been leased for a new municipal airport. Work of clearing the land is to be started immediately and the hangar at the present temporary airport is to be moved to the new field. A much larger hangar also is to be provided as soon as the ground is cleared.

**T**HE aviation committee of the Abilene Chamber of Commerce again is headed by George L. Paxton, Jr. Other members of the committee are: J. McAllister Stevenson, Max Bentley and W. G. Swenson.

The city's aviation goal for the year is a municipally owned and operated A-A airport. The proposition is to be submitted to voters on April 2, in an election for a pro-

posed charter amendment empowering the city to buy land and build an airport.

The present landing field at Abilene is known as Kinsolving Field.

**B**ECAUSE of the comparative newness of Kinsolving Field at Abilene, 1928's record of 392 transient planes stopping at the municipal landing field with 754 pilots and passengers is a record of which the aviation division of the Abilene Chamber of Commerce is proud.

**E**IGHT or nine possible airport sites are under consideration by the aviation committee of the Vernon Chamber of Commerce, according to M. K. Berry. Selection of the site is to be made within a short time.

**A** BOND issue is to be voted on by the City of Tyler, one section of which provides \$25,000 to be spent in equipping a municipal airport.

## DALLAS AIR NEWS

By CAPT. W. H. SCOTT

**R**EORGANIZATION of the Dallas Aviation Industries and the Dallas Aviation School was completed here, with the Morriss brothers, auto dealers, buying a large interest in the concern. The flying school will be continued by Capt. W. F. Long, as president, and C. E. Harmon, secretary. The Dallas Aviation Industries will devote itself to the manufacture of planes of a new type, the overhauling of planes and engines, and will be agent for parts and instruments.

**T**HE largest single order for planes ever given in the South was made by the Dallas Aviation School and the Southern Airways of San Antonio, when fifty American Eagle planes were ordered for delivery to the companies and their associates.

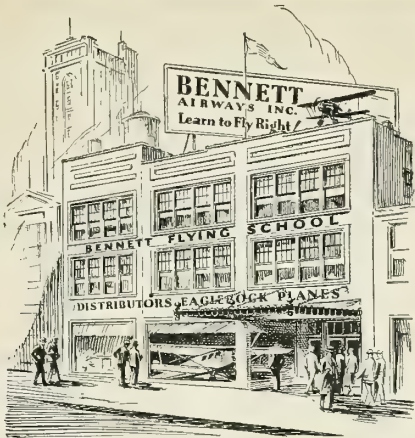
**C**APT. J. L. FREEZE, secretary of the Dallas Flying Club, with various flying organizations of Texas, will petition the state legislature for a repeal of the state tax on gasoline, as far as it affects airplanes and the airplane industry in Texas.

**H**OWARD WOODALL and G. W. Shaw, recently sold their interest in Travel Airways and the Travel Air franchise to the Texas Air Transport. The big hangar is being thoroughly remodeled and will be used as a flying school, parts warehouse and display room.

**T**HE yearly statement of the Dallas Aviation Industries and the Southern Airways, issued in February, shows that over fifty planes of various types have been sold to governments at Mexico, Chile, Guatemala, Colombia and China and that students from every state in the Union and China, Canada, Mexico and Cuba had been trained.

Airplane parts to the value of over \$250,000 had been sold. Over 80 students have

(Continued on next page)



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Aviation offers generous rewards—but demands the best of men! Don't sacrifice your future, in this, the greatest of all careers, with a makeshift course.  
For, now, the Bennett Easy Pay Tuition Plan enables all thinking men to afford the most thorough aviation courses offered in America. You enroll with small down payment, completing balance after graduation, when earning, in small monthly installments. Coupon for details.

complete ground mechanics, primary flying, limited commercial course, and the transport course which gives aerodynamics, meteorology, navigation, 200 hours of flying after solo and cross country flying.  
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Please send your complete catalog of courses and details of time payment plan. I am interested in:

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- ☐ Limited Commercial
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Name .....Town .....State .....

BENNETT EAGLEROCK SALES CO., DISTRIBUTORS OF EAGLEROCK PLANES



(Dallas Air News continued)

taken training since operations for this year started in January. Over 95 per cent of the students came to Dallas through reading advertising in AERO DIGEST.

THE clubhouse for army officers at the new municipal field at Grand Prairie is to be remodeled. The ground floor will be used as administrative offices, lounge and dining rooms. Upstairs will be devoted to sleeping quarters for officers and men. The Government will erect three hangars at the field, and the Dallas Chamber of Commerce will provide \$18,000 for the shipment of the hangars from their present location.

THE Paul Braniff Air Lines, Inc., opened its new passenger line, between Dallas and Tulsa, by way of Fort Worth, Wichita Falls and Oklahoma City on February 12, with the arrival at Love Field of a Stinson-Detroiter with Gene Morriss at the controls.

The schedule of the line calls for planes to leave Dallas and Tulsa at 8 a. m., and arrive at their destination at 1 p. m. Passengers and express packages are being carried.

## SAN ANTONIO AIR NEWS

By GENE SMITH

SAN ANTONIO has been designated the terminal of six passenger airlines radiating to practically every important city of Texas, according to announcement from J. C. McDermott, division traffic manager of the Texas Air Transport Company. This company has purchased 13 new Travel Air cabin planes.

Schedules for operation of the lines now are being mapped out with the intention of putting them in operation soon. Present plans are to route the planes from San Antonio to Brownsville, to Houston, to Fort Worth and Dallas, to Big Spring and Amarillo, to San Angelo, to El Paso, and to Laredo.

The City of San Antonio is considering construction of hangars at Winburn Field, municipal airport, for rental to the T.A.T., for terminal facilities. This step is being advocated by the San Antonio chapter of the National Aeronautic Association.

FOUR representatives of the Universal Air Lines System are making a survey of a proposed route from Montreal, Canada, to the Panama Canal Zone, via San Antonio.

Those in the party are: R. J. Lentz, chief pilot of the company; C. T. Schramm, business manager; C. R. Sinclair, co-pilot, and Frank Borys, mechanic.

Schramm announced that the purpose of his visit to San Antonio was to select a suitable base for operations of the company in its southern district. In addition to the facilities of the municipal field, Winburn Field, he spoke of the importance of the operation of Randolph Field, the new Air Corps training center of the Army, 15 miles from San Antonio.

## LOUISIANA AIR NEWS

By HAROLD A. DEMPSEY

THE Baton Rouge Chamber of Commerce has circulated petitions for a parish-wide election to provide the necessary funds for an airport. At this election will be voted a tax of three-tenths mill over a period of five years for the purpose of raising \$150,000 for the purchase of land and equipment.

The last session of the Louisiana Legislature passed a law authorizing the people to vote a special tax for such a purpose in their respective parishes.

COINCIDENT with the formation of plans for an airport, the Baton Rouge Aero Club was formed recently. The following officers have been elected: James T. Amis, president; R. A. Whitaker, vice president; and N. S. Dougherty, secretary-treasurer. Within two months the club expects to have its first plane in operation and to hire an instructor.

ACCORDING to George W. Williams, president of the Texas Aero Corporation, Temple, Tex., Shreveport is being considered for the location of his company's new headquarters.

Mr. Williams went over prospective sites and preliminary negotiations on a recent visit to Shreveport.

NEW ORLEANS is to have another airport, under an ordinance introduced before the City Commission Council. The ordinance calls for the designation of a portion of the Rose Hill cemetery tract, measuring 3,103 feet in depth, as a flying field. The proposed site is only about eight minutes from the heart of the business center of the city.

THE Southern Aeronautical Service, Inc., New Orleans, has purchased a 220-acre site between Westwego and Marrero, to be used as an airport. The land is being cleared, and the construction of four hangars is now under way.

According to Captain Robert Polk, who is president of the company, a passenger and freight airline between New Orleans and Chicago will be inaugurated soon. Stops for passengers and refuelling will be made at Jackson, Miss.; Memphis, Tenn.; and St. Louis, Mo. The time consumed will be ten hours, and the fare will be \$75 one way or \$135 round trip. Three Ford trimotors will be in service along the proposed route.

The Southern Aeronautical Service, Inc., recently established a school in New Orleans.

### Standard Oil Marking Program

FIRM in its belief of the future of aviation in the South, the Standard Oil Company of Louisiana is forwarding the marking of air routes through Louisiana, Arkansas, and Tennessee. This development will mark 374 towns and cities.

Although few private individuals in these states have planes, and there have previously been no air routes here, the action of the

Standard Oil Co., in blazing ways over the South indicates that the day of commercial and pleasure flying has come. These airway guides will direct air tourists just as markers on the highways serve motorists.

The airway markings in towns and cities which have landing fields will show the name of the town, an arrow pointing in the direction of the landing field, and figures showing the exact distance to the field. There are sixty-five cities in Arkansas, Tennessee and Louisiana which now have landing fields, and several cities boasting modern airports.

In 310 towns and cities in these states that have no landing fields, the roofs of the company's buildings are marked with the name of the town, and, if within ten miles of a landing field, an arrow pointing toward the field with figures giving the distance. If there is no landing field within ten miles, the arrow points north.

All the markings are painted in chrome yellow on a black ground, which conforms to Government specifications.

## GEORGIA AIR NEWS

By AL MAJOR.

LEO C. WILSON, Southeastern aircraft inspector of the Department of Commerce, has designated Atlanta as his headquarters, and will establish temporary offices at Candler Field. Mr. Wilson will have jurisdiction over North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Tennessee. He transferred his office to Atlanta from Miami. Mr. Wilson will have two assistants to help him cover the territory—Charles A. Rowe, and Mr. Hall. Mr. Wilson's principal duties will be to examine pilots, inspect planes for air worthiness, and to assist in enforcing the regulations of the Department of Commerce.

AMONG the visiting pilots who have recently landed at Candler field were: William S. Brock and Edward F. Schlee in their Lockheed Vega, en route to Cincinnati and Detroit. Also, Cy Caldwell, AERO DIGEST writer, in a Fairchild cabin monoplane of the Goodrich Rubber Company.

THE American Airports Corporation has leased a suite of offices in the Candler Building which will serve as Southeastern headquarters for the corporation. Capt. Stanford E. Moses, U. S. Navy retired, will be in charge of the local office.

THE New York-Atlanta air mail line in January carried 21,490 pounds of mail as compared to 20,906 in December and 16,888 in November. In January the Atlanta-New Orleans line transported 4,462 pounds as against 4,353 in December, and 4,096 in November. 6,083 pounds were handled in January by the Atlanta-Miami line, while 5,841 pounds were carried in December. The Atlanta-Chicago route operated by Interstate Airlines, Inc., was the only line to show a decrease. In January it handled 6,438 pounds as compared with 7,779 in December.

(Continued on next page)

# THE SPORT WACO



**H**ERE is the pride of the makers of WACO... a remarkable airplane... fast, maneuverable, brilliant in its performance... yet withal a practical workaday aircraft.

*Speed!* Speed to get there ahead of appointments. Speed disdainful of wind and weather. Speed which won such major air events of 1928 as the transcontinental derby. John Livingston, the winner of that event, reports an *average* cruising speed of 129.4 mi. per hr., for more than 10,000 miles of flying in his sport WACO.

*Responsiveness!* Instant response to the touch of a finger. Performance that tingles and thrills. But performance marvelously combined with such pronounced inherent stability that the ship flies "hands

off" much of the time. And it settles to earth with the same easy precision as the straight-wing WACO, even though 7 to 8 miles faster in landing speed.

*Dependability!* The satisfaction of proved reliability. Confidence in those "invisibles" which are the measure of real worth. Zooming climb from take-off and short roll after contact of wheels to ground... characteristics that simplify emergency landings and make for *practical* commercial use.

Brilliant performance to thrill and satisfy... flawless workmanship to instill confidence and conquer emergencies... custom finish to express individuality...

You, too, will be proud to own a sport WACO.

## SPECIFICATIONS and PRICE

WACO "Ten-T", 1929 model tapered wings, with "J-5" Wright, Whirlwind motor

**\$8525**

### Standard equipment includes:

Customer's choice of colors of wings, fuselage and upholstery.

Improved type cowling and windshield for maximum protection to pilot and passengers.

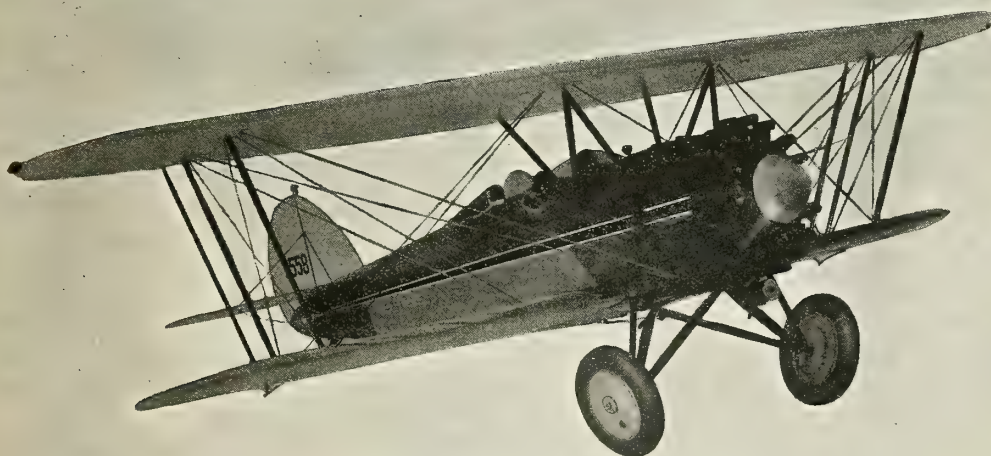
Upholstered cockpits—luggage compartment.

Streamlined undercarriage—Bendix brakes—30 x 5 wheels.

Metal propeller—hand starter—primer—compass—tachometer—air speed indicator—altimeter—oil pressure, oil temperature and gasoline gauges—navigation lights—fire extinguisher—emergency kit.

Dual controls.

Faultless workmanship and rigid inspection—the "invisibles" that have made WACO's reputation.



THE ADVANCE AIRCRAFT COMPANY, TROY, OHIO



"ASK ANY PILOT"

Say you saw it in AERO DIGEST



(Georgia Air News continued)

**POSTMASTER GENERAL NEW** announced recently that Macon, Georgia; Daytona Beach, Orlando, and Tampa, Florida, will be made regular stops on the Atlanta-Miami air mail route effective March 1st.

**A** SURVEY of the Atlanta-Chicago air mail route with a view to establishing beacons and emergency landing fields for night flying has been completed, and bids have already been asked for the improvements on the Chicago-Evansville section of the line.

## MISSISSIPPI AIR NEWS

**T**HE city of Gulfport and the board of supervisors of Harrison County are co-operating in the development of an airport at Gulfport. Located two miles from the center of the city, the field covers an area 3960 by 2640 feet. The only obstructions are telephone lines on the south and east sides. When completed, the airport is expected to be one of the best in Mississippi.

## ALABAMA AIR NEWS

By ROBERT H. BROWN

**T**HE junior chamber of commerce is air marking Birmingham with eight signs on buildings, indicating the direction to Roberts Field. The junior chamber also is pushing a campaign for a new municipal airport for that city.

**N**ORMAN WISE, who operates a field near Huntsville, recently addressed the Acme Club of that city on the airport needs of the city. The Acme Club then planned to make an extensive campaign for an airport.

**O**BSTRUCTION and boundary lights have been installed at the Anniston Airport, according to H. K. Glidden, Department of Commerce, who has been supervising the work.

**L.** G. MASON and George McVaughn, of Montgomery, are planning to establish an air school there when the new municipal airport is established. When completed, this airport will be the finest in the South.

**J.** H. WILLIS, assistant city attorney, is drafting a section in the Birmingham city code applying the Department of Commerce regulations for airplanes and pilots. These Federal restrictions are for interstate traffic only.

**C.** O. YOAKUM, of Birmingham, vice president of General Securities Corporation, has been named a director of the Gulf Air Lines, Inc.

**A** TENTATIVE appropriation of \$1,000 has been made by the city commission of Mobile for the city to participate in the

South American Trade Extension Flight. The venture will cost the city approximately \$10,000. The balance will be taken care of by the junior chamber of commerce.

**T**HE Huntsville *Daily Times* is the first newspaper in the state to adopt airplane delivery. The paper sends by air one edition a day to Athens, Ala., twenty-seven miles from Huntsville.

## KENTUCKY AIR NEWS

By A. W. WILLIAMS

**D**EVELOPMENT is progressing rapidly at Bowman Field, Louisville. Through a special act of the Kentucky Legislature, the flying field is now out from under the Park Board, and entirely under the air board, which has moved its offices to the field, from the City Hall. The air board is composed of Addison W. Lee (chairman), Albert N. Woody, L. S. Vance, Frank Rash, William A. Clarke, and William Kammerer.

The Louisville and Jefferson County Board, in charge of the developments, recently completed field lighting, including floodlights, boundary and obstacle lights, and plans to erect a municipal hangar. Sites for hangars 2, 3 and 4, will go to the Curtiss Flying Service, the board reserving site No. 1 for its own use.

The Curtiss Flying Service has taken a ten year lease on space for hangars, which it will erect itself, and for use of the field in flying. It has a deal pending with the Cardinal Fliers, of Louisville, to take over that company, which is headed by Lee Miles, of the Louisville Taxicab Co., as president.

**T**HE first retail agency in the downtown section of Louisville was recently established by the Pickrell Motor Company. This company has taken on the agency for the American Eagle plane, and has provided space in one of its show windows for a permanent airplane exhibit.

The company has arranged a hook-up with the Southern Air College, which has the distribution in this territory for the American Eagle. The college operates a flying field just outside of the city, and has facilities for demonstration, instruction, hangar, gas pumps, repair facilities, etc. The college keeps one man on the Pickrell floor all the time.

W. S. Reinhart is president of the Southern Air College; and H. G. Brooks, Jr., is secretary-treasurer.

**O**N February 11, the National Aviation School, Louisville, began a series of evening lectures.

The first lecture was by R. R. Bottoms, director of research for the Kentucky Oxygen-Hydrogen Co., Louisville, on gases used for lighter-than-air craft.

The second lecture was by C. E. Strack, general manager of the Crescent Panel Co., Louisville. Mr. Strack's subject was laminated woods and glues, the plywoods used in aviation.

A third lecture was by A. J. LaPointe, chief research chemist for the Peaslee Gaul-

bert Paint & Varnish Co., regarding varnishes, lacquers and dopes, paints, etc., used in completion of aircraft.

The fourth in the series was by Dr. B. D. Choate, medical examiner for the aeronautical branch of the Department of Commerce, who spoke on the physical requirements of pilots.

**T**HERE are now four aviation schools in Louisville, — the National Aviation School, the Southern Air College, the Louisville Aviation Co., and the Cardinal Fliers.

**O**NE of the oldest planes in the country was destroyed at Henderson, Ky., in early February, when the old Rash tobacco warehouse was burned, and with it a Curtiss pusher type of plane belonging to Baxter Adams, a pioneer western Kentucky aviator, who had it stored away in the building.

Adams purchased the plane in 1914, from the Curtiss factory at Hammondsport, N. Y. It used a Curtiss eight-cylinder, 100 h.p. motor.

Adams flew the plane in exhibitions in state after state from New York to California.

**B**IRDMEN who should ever happen to land in Hopkinsville, Ky., would find that they were using Renshaw Field, owned and operated by Col. Ed Renshaw of that city.

**S**TEPS are being taken by citizens of Russellville and Morgantown, county seats of counties adjoining Warren County, to provide airports for the two towns. Backers of the moves believe the landing fields will be completed in the immediate future.

## Louisville Notes

By J. Rogers

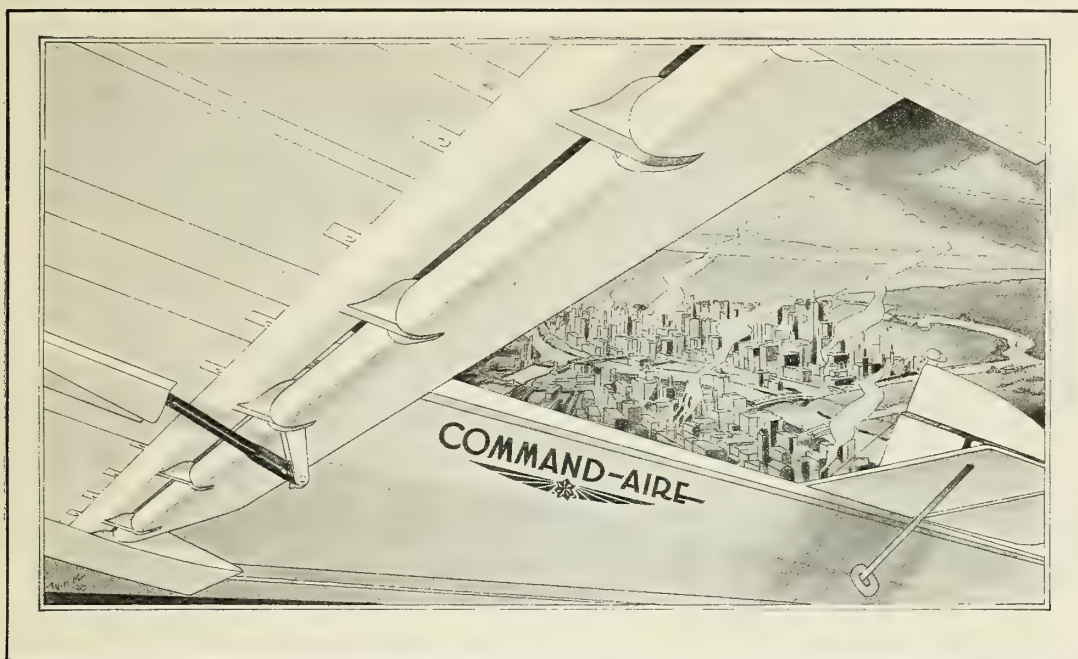
**T**HE Fifth Corps Area has designated the week of March 18-23, as the dates for the final examinations to be held to fill approximately one hundred vacancies in the Army Air Corps. Successful candidates will be appointed second lieutenants in the Air Corps.

**L**IEUT JAMES ELLISON, in charge of the military post at Bowman Field, the municipal airport in Seneca, has been selected as the chairman of a special aviation committee to arrange for an air program for the national American Legion convention that will be held in Louisville next September through October the third.

The committee, which will have complete charge of the air program, will provide air races, stunt flying, and practical demonstrations for the entertainment of the visiting Legionaires.

Others who were appointed on the special aviation committee with Lieut. Ellison are: Robert Gast, William Morrow, A. H. Bowman, Huston Quinn, Addison Lee, James C. Willson, Lee L. Miles, and Thomas Hayden, Jr., department adjutant of the American Legion.

(Continued on next page)



# STALL SPEED CONTROL

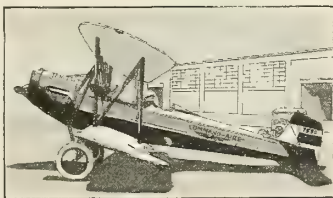
## *Command-aire ailerons banish sloppy control*

The picture gives you a clearer conception of COMMAND-AIRE aileron feature than miles of description might afford.

For instance, the exclusive advantage of slotted joining to the lower wings only. This requires but slight movement of the stick even for very steep banks.

Again, it provides positive control at stall speed, whether in the air or landing. Striking proof of COMMAND-AIRE

stability was to have the pilot leave the cockpit and ride the fuselage, while the plane flew on under perfect self control (photographic evidence furnished on request).



To the dealer, COMMAND-AIRE'S superiority of design and construction brings a vital advantage—namely, the widest possible market; among youth through speed, stability and smart appearance; among middle age in maximum assurance of stability.

The franchise may still be open in your territory. Write for the COMMAND-AIRE proposition.

COMMAND-AIRE, INC.  
Little Rock, Arkansas

# COMMAND-AIRE



THE PLANE OF WIDER SALES



(Kentucky Air News continued)

**B**OWMAN FIELD, the municipal airport in Seneca Park, will become one of the seven United States Army Reserve flying fields under the terms of a lease for twenty years approved by the Louisville and Jefferson County Air Board. The lease was executed by Lieut. James Ellison, commander of the military aviation post now stationed at the field.

The signing of the lease will make it possible for a Congressional appropriation to be made which will provide funds for the erection of hangars, shops and other necessary buildings at the field.

**A**IR express service between Cleveland and Louisville has been put in operation here by the Continental Air Lines, Inc., holders of the air express contracts of the American Express Company. Stops along the route will be Akron, Columbus, Dayton and Cincinnati.

The planes, which will arrive at the terminals, Louisville and Cleveland, daily will carry mail as well as express. Single shipments will be limited to two hundred pounds.

**O**PERATION of a new air mail route from Louisville to Dallas or Fort Worth will begin within sixty days, it has been announced by Assistant Postmaster General Glover. Operation contracts will be asked for soon.

The Post Office Department expects to have along the new route several stops in Tennessee and Arkansas, but the exact route has not yet been fully worked out.

## TENNESSEE AIR NEWS

By VIRGINIA MATTHEWS

**J.** M. WULPI, division traffic manager for the Interstate Airlines, Inc., of Chicago, is in Nashville conducting an extensive publicity campaign for the purpose of increasing the air mail poundage here. Radio talks, daily news items on air mail poundage, air mail streamers and civic club talks have been arranged by Mr. Wulpi, resulting in a definite mail poundage increase.

**B**IDS on the proposed Southwestern air route passing through two Tennessee cities, Nashville and Memphis, will be asked within the next 30 days according to announcement from postoffice officials at Washington, D. C. The route will extend from Louisville, to Nashville, Memphis, Little Rock, Ark., and on to the Southwest.

**R**EFERENDUM on the proposed \$200,000 bond issue for the completion of McConnell Field, Nashville, will be submitted to the voters at the next election scheduled for August, 1929. Experts from the Department of Commerce have declared that in all probability the field will have an A-1 ranking on completion.

In preparation for the inauguration of night flying through Nashville on May 1, Lieut. Col. W. G. Schaufner, manager of

the Interstate Airlines, Inc., was in Nashville recently to consult with city officials concerning the location of a new field in Nashville.

## CHATTANOOGA NEWS

By JAMES S. LINDSEY

**M**R. SITWELL, one of the government's surveyors of airports, was in Chattanooga recently to inspect the sites chosen for a municipal airport. The site most favored is near Chicamauga Park. This tract contains about four hundred and sixty acres and has excellent facilities, being located about seven miles southeast of the city, east of Missionary Ridge, which causes it to be free from smoke and fog. Several locations, including the present location of Marr Field, were considered hazardous because of the smallness of the field and poor visibility.

**M**EMBERS of the city airport committee and other city officials returned recently from an inspection tour of Cincinnati and Dayton, Ohio, airports. The purpose of the tour was to get suggestions and ideas from Government officials and to get the general lay of a well designed port. Members of the party included Commissioners Cash and Crox, and Claud Crox and City Engineer W. H. Wilson.

## INDIANA AIR NEWS

By H. GENE HAYNES

**C**HARLES A. LINDBERGH was recently in Indianapolis in interests of the Transcontinental Air Transport, Inc. He conferred with Governor Harry G. Leslie at the state capitol building and with Capt. H. Weir Cook and other officials of the Curtiss Flying Service of Indiana.

**M**EMBERS of the Indianapolis Association of Credit Men recently heard a talk by William P. MacCracken, Jr., Assistant Secretary of Commerce for Aeronautics.

**T**HE 1000-acre municipal airport west of the city will be sold to the City of Indianapolis within a few weeks, Mayor L. Ert Slack has said. Plans are being made to tear down obstructions on the property so that planes can land soon after the property is purchased by the city. Workers will start immediately to level the ground and erect buildings.

Paul H. Moore, head of the aeronautical division of the chamber of commerce, returned recently from Washington, D. C., where he conferred with Department of Commerce officials on matters pertaining to the municipal field.

**L**IGHTING of the airway between Indianapolis and Dayton and establishment of emergency landing fields along the route is being arranged by Walter Avery of the Department of Commerce airways division.

Avery said the landing fields are to be established approximately 25 miles apart for

benefit of the T. A. T. The fields are leased and equipped by the Government. Beacon lights will be erected at 10-mile intervals.

The airway between Dayton and Columbus, Ohio, is already lighted.

**R**ESIDENTS of Newcastle, fifty miles from Indianapolis, attended a banquet recently to pay tribute to Wilbur Wright, who was born on a farm about six miles from Newcastle.

Newcastle citizens have been campaigning to have a legislative bill adopted at this session of the state assembly permitting the Newcastle Wright commission to purchase the Wright homestead and to erect a shrine thereon.

The speakers included Governor Harry G. Leslie, Capt. B. B. Lipsner of Chicago, first U. S. air mail superintendent, and members of the state assembly. L. O. Draper, state senator from Newcastle, asserted he would introduce the legislative bill permitting the purchase of the homestead.

**P**LANs for the production of a new plane, which probably will be known as the DAC, have been announced by Capt. Walter C. Davis, president and general manager of the recently organized Davis Aircraft Corporation, of Richmond.

The new Davis organization has acquired the Vulcan Aircraft Company, of Portsmouth, Ohio, builder of the American Moth. All machinery, tools and equipment necessary for the manufacture of the plane are being shipped from Portsmouth to Richmond.

The DAC is designed for business and pleasure, for club use and for student training. Powered with a LeBlond motor, the DAC will have a cruising speed of 90 miles an hour, a top speed of 115 miles an hour and a landing speed of 38 miles an hour. The weight of the plane empty is 660 pounds. It has an overall length of 18 feet and height of 6 feet 9 inches. Construction is entirely of metal with the exception of wing spars and the fabric covering of fuselage and wings. By the removal of four pins, the wings can be folded permitting the plane to be placed in a small hangar.

## Elkhart Air Congress

By P. L. Anderson.

**J**UNE 14, 15 and 16 are the dates that have tentatively been decided upon for the second annual American Legion Air Congress in Elkhart, under auspices of the Thomas McCoy Post No. 74 of the American Legion.

More than 100 planes of all types and descriptions will probably be entered in the various events of the three days, according to Major George Schafer, post commander. There will be a variety of air races, contests, exhibitions, and stunts throughout each day's program. Cash prizes will be awarded in each event. The first meet a year ago was so successful that Legion members immediately started making plans for this year's exhibition.

(Continued on next page)

One of a series of advertisements featuring planes on which Aerol Struts are standard equipment.



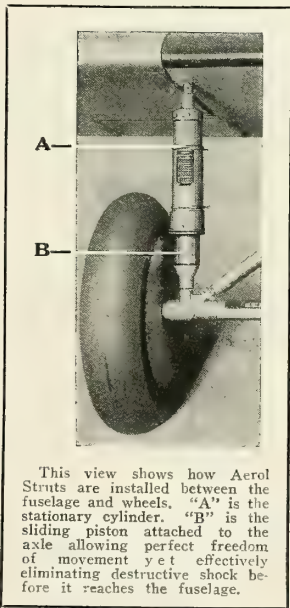
## RYAN PERFORMANCE AND AEROL STRUTS

**A**MONG the prominent ships whose performance is closely linked with that of Aerol Oleo-Pneumatic Struts is the new 1929 Ryan Brougham.

In adopting these remarkably efficient landing struts as standard equipment, the Mahoney-Ryan Aircraft Corporation not only insures their owners smoother, safer landings and snappier take-offs, but guarantees the motor and fuselage unexcelled protection against landing shock and rough taxiing.

Some conception of the acceptance that has been awarded Aerol Struts may be had when it is realized that twenty-two aircraft manufacturers have already standardized on this equipment, and practically all

others are offering them as optional equipment.



This view shows how Aerol Struts are installed between the fuselage and wheels. "A" is the stationary cylinder. "B" is the sliding piston attached to the axle allowing perfect freedom of movement yet effectively eliminating destructive shock before it reaches the fuselage.

Employing the oleo-pneumatic principle, the *only principle* that enables a strut to absorb shock in *progressive ratio*, Aerol Struts stand alone in the aircraft field. The popularity they enjoy among pilots and operators bears out the statement that we made last year. Let us repeat it again:

"The Aircraft Manufacturers offering Aerol Struts are going to find them a big factor in disposing of their 1929 production."

There is an Aerol Strut for every type and weight of plane. For information, write to The Cleveland Pneumatic Tool Company, Cleveland, Ohio.

ASK THE PILOTS WHO LAND ON THEM

# AEROL shock absorbing STRUT



(Indiana Air News continued)

## Notes from Richmond

By John J. Green.

**J. C. BELDEN**, president of the Belden Manufacturing Company of Chicago and Richmond, Ind., recently announced plans for the construction of a \$235,000 unit at the Richmond plant.

The company, which manufactures ignition and other wire for airplanes, automobiles, radios and a variety of other uses, has had the first unit of a new plant operating at Richmond for about two years.

The second unit, which will be ready for occupancy in September, will bring the total floor space of the Richmond plant to 197,000 square feet.

**FORMATION** of the Richmond Airways Corporation, capitalized at \$25,000, was recently announced. A 100-acre site has been leased and a new airport will be developed as soon as weather permits work on the field. The site lies on the south side of the National road, two and a half miles west of Richmond. It is level and will require little grading. Dimensions of the field are 2,500 by 1,800 feet, and a runway 3,300 feet long in the direction of prevailing winds is available. There are no obstructions on the east, west or south.

Construction of a hangar is expected to be under way by the middle of March.

Associated in the Richmond Airways Corporation are L. B. Lower and L. F. Miller. Purchase of additional equipment is expected within a few months. The new airport site is served by three bus lines and an electric railway. Directly across the National road is a widely known inn where meals and lodging are available.

It is probable that the Davis Aircraft Corporation, recently formed for the manufacture of a small monoplane in Richmond, will use the new airport as a test field.

## OHIO AIR NEWS

By T. E. LUNS福德

**THE** Aircraft Securities Corp., of the State of Delaware, has been granted authority to do business in Ohio, centering its activities in Dayton. The officers of the Ohio organization are: Samuel L. Finn, president; Hubert A. Estabrook, secretary; and Rowland H. McKee, treasurer.

**C. E. McLAUGHLIN**, former district sales manager of the Holland Furnace Co., has been placed in charge of sales of the Robbins Flying Service, Stow, and the aviation school to be operated by that service at Akron. Hugh Robbins is head of the service. The school, which will be operated in two sections, has a total registration of 84.

**A** NEW building will be erected at the Government airport at Parkman, in Geauga County, and attendants will be stationed there to check passage of planes between the field and Cleveland.

**CREATION** of a state aeronautics bureau to be headed by a commissioner is proposed in the Ohio Legislature by Representative David S. Ingalls of Cleveland, World War flier and chairman of the joint legislative committee on aviation.

The commissioner would be empowered to prescribe regulations governing aviation, including the licensing of aircraft and airmen, the regulations to conform with the Air Commerce Act of 1926. Three fees of \$15 each are provided in the bill for licenses, examination and inspection of aircraft, and issuance of certificates of registration.

A penalty may be imposed under a clause of the proposed legislation for failure of airmen to comply strictly to the law. The bill also provides that in 60 days after a municipality has been directed to place suitable markings at designated points and fails, the commissioner may do the work himself, charging the cost to the municipality at fault.

**A** NEW circular air route connecting Columbus, Pittsburgh, Dayton, Cincinnati, Huntington and Wheeling, W. Va., will probably be put in operation by the United States Inland Airways Corporation May 1. The new passenger, mail and express route will include stops at Parkersburg, W. Va., Portsmouth and Zanesville, O.

The Canton City Council has passed an ordinance, over the veto of Mayor C. C. Curtis, authorizing a bond issue of \$78,375 to purchase the chamber of commerce site of 224 acres on the Harrisburg Road and to buy initial equipment for a municipal airport. Another ordinance approved provides for the appointment of an airport commission. The commission will meet with the mayor and service director to direct the operations of the airport.

**THE** Columbus City Council has passed a resolution declaring the city's intention to acquire more land and bring the total area of the municipal airport to 750 acres. The council also voted to permit the Transcontinental Air Transport Co. to proceed with the construction of a hangar. The Middle State Construction Co. was awarded the bid for the project.

**ARTHUR R. ALLEN** was recently elected president of the Norton Flying Club, Columbus. Other officers elected are: Dr. E. M. Freese, vice president; Joe Allen, treasurer; Robert Bohannon, secretary; and Harold Distlehorst, operations manager.

**OPTION** has been taken on a tract of land at South Point, near Ironton, by the Embury-Riddle Co., Cincinnati, as a preliminary step toward establishing an airport and flying school.

Mechanical information about airplanes, their operation, technical information about air navigation and meteorology will be furnished in a general course in aviation in the Cincinnati public schools.

At first the course will be limited to night

sessions, later it will include day sessions and eventually may include actual flying. The course, which will be conducted in co-operation with the Federal Government, will cost the board only one-half the cost of instruction, the remainder coming from the Smith-Hughes fund for vocational education. The course will be started about March 15, when the new automotive trade school building will be completed.

**OFFICERS** of the Dayton Airplane Co., state that the concern is about ready to enter upon a program of quantity production of three types of engines. One of the engines to be manufactured by the company is 125 h.p., another 225 h.p., and the other 500 h.p. Officers of the Dayton company are: R. R. Grant, formerly production engineer with the Air Corps during the war, president; and G. A. Funkhouser, secretary.

**E. A. NEUTZENHOLZER**, president of the Massillon Chamber of Commerce, has appointed the following committee to make a study of the airport problem in that city: Charles D. Beans (chairman), C. M. Shafer, Arthur T. Ellis, C. R. Basht, Godfrey Geis, W. E. N. Hemperly, Walter Sorg, C. H. Whitman, C. J. Lipps, C. E. Rice and Paul Stewart.

**THE** Columbus Aero Club has elected the following officers for the ensuing year: C. L. Morris, president; Guy Harris, vice president; Dr. E. M. Freese, treasurer; A. J. Frame, secretary; and Captain Ralph Williams, manager.

**THE** Marion Chamber of Commerce named the following committee to work in co-operation with the junior chamber of commerce on aviation activities: Ed C. Watters, Wilfred Schaffner, and Charles Whysall.

**A** NERO club has been organized at Van Wert with the following officers: Richard Webster, president; Barton Webster, vice president; Jack H. Weaver, secretary-treasurer. Directors are Wilbur C. Cotner, Clifford Marsh and Russell Byers.

**THE** Minerva Aircraft Corp. has been incorporated at Akron. The purpose of the company will be to construct a test airplane to specifications laid down by Harold Johnson.

**C. E. WHELAND** has been elected president of the Tuscarawas County Aviation, Inc., recently organized at Urichsville. Harry R. Clever was chosen as field superintendent.

The company has leased the 75-acre flying field at Schoenbrun, near New Philadelphia, which Clever has been operating for the past year.

**STEPS** have been taken for the establishment of an airport on Kelley's Island in Lake Erie.

(Continued on next page)

# WIN YOUR WINGS

## Sunny Texas

*Where Flying Conditions Are Best—Where Practically Every Day Is Flying Weather—At One Of The Largest And Best Equipped Flying Schools In All America*

Students at Dallas Aviation School qualify for all branches of flying and ground work more quickly than elsewhere—why? Because Dallas has uniformly ideal flying weather, and because of the splendidly adequate faculty and equipment that give this institution one of the highest ratings in America.

### *Aviation's Greatest Season Is At Hand Will You Be Prepared In Time?*

Will you share in the golden opportunities which the early summer will bring to those who have the foresight to qualify now? You can—but TIME is everything! There's no time to lose in starting—no time to lose as you go—because of unfavorable weather or anything else.

You can WIN in the race for the best places in aviation if you chose Texas for your training place—and Dallas Aviation School for your instruction.

During the war and ever since, Texas has trained more flyers than any other state. The same advantages of climate and topography that caused Uncle Sam to make Texas the center of war training assure you of everyday flying all Spring, while students in other regions are sitting idly waiting for flying time.

#### **A Wonderful School**

Advantages of location and otherwise have made Dallas Aviation School one of the largest and best known flying schools in the country.

A faculty composed of veteran transport pilots, under the leadership of Captain W. F. Long, war-time overseas pilot and president of the school, provide instruction of unsurpassed thoroughness and efficiency.

Ample financial strength—and up-to-date equipment throughout—close contact with army, commercial and private flying activity at a major airport—these are among the advantages you'll enjoy when you enroll with us. Students from nearly every state and from Canada and Mexico are here now—flying—even as you are reading this! Our graduates are in many of the biggest jobs in aviation—known and respected from coast to coast.

All our equipment is new and up-to-date. No student is exposed to the hazards of overhauled or "rebuilt" ships or motors; rigid supervision by Capt. Long in person and constant attendance by a U. S. Government inspector insure maximum safety and efficiency. No bonds for breakage are required.

#### **We will help you locate**

On the ground there's a great field for officials, factory superintendents, inspectors and mechanical foremen, airplane distributors and salesmen, etc. In the air demand grows for transport and private pilots in a thousand capacities.

The prominence and high standing of Dallas Aviation School and Captain Long among airplane manufacturers and pilots all over America assure you of a wide scope of opportunities upon graduation. There's no limit to what you can accomplish in this vast new industry save the limits of your own ability, and we take a close personal interest in every student's future.

#### **You can earn as you learn**

The school is on the outskirts of Dallas, a city of 290,000 where employment can be secured for part time, and the School courses can be arranged to suit. For those who desire social activity Dallas people are receptive and cordial.

#### **How you save**

Charges for tuition at Dallas Aviation School are the same as at other best-grade schools, but the rapidity of your training and the time you will save mean a saving of one-third or more of your training-period expense, beside putting you into a paying position while others are still in training.

Excellent living accommodations are available adjoining the school at extremely moderate costs, or you may live wherever you like. You will find no lack of congenial companions and you will have opportunities to meet many well-known flyers.

Clip and mail the coupon below for complete details—then you'll come to Dallas Aviation School. And when you come you'll find a REAL school, a tremendous opportunity, and the best lot of fellows on earth.

# DALLAS AVIATION SCHOOL

## DALLAS, TEXAS

**WRITE TODAY!**

*Please Send Full Particulars:*

Name .....

Address .....



(Ohio Air News continued)

**HOWARD BURLESON**, former pilot with the Lincoln Aircraft Co., Lincoln, Nebr., has been appointed an instructor for the Ohio State school of Aeronautics at the Sullivan Ave. Airport.

**STATE REPRESENTATIVE DAVID S. INGALLS**, World War flier, has been elected president of the National Air Race and Show Corporation which is to have charge of the national air races to be held in Cleveland this summer.

**A MAJORITY** of insurance companies operating in Ohio have lifted the ban on use of airplanes. It is stated that no objection is had when flights are taken in licensed ships, piloted by licensed pilots, in a straightaway flight between specified points.

**THE O. M. Scott and Sons Co.**, of Marysville, Ohio, is offering specialized advice and information on the sowing of the proper varieties of seed for satisfactory landing field turf at airports.

**USE** of the Willys-Overland administration building roof in Toledo has been given for an airport marker. The roof is finished in vermillion brick, and an arrow fifty-six feet long points to the airport on the edge of the city.

**THE United States Electrical Tool Co.**, of Cincinnati, the oldest manufacturers of portable electrical drills and grinders, has announced a new six-inch grinder to the U. S. line.

## CLEVELAND AIR NEWS

By DAVID E. IRWIN

**OPERATORS** on Cleveland Airport have organized the Cleveland Airport Operators' Association and have opened a downtown ticket office and air travel information bureau in conjunction with the Cleveland Automobile Club.

Officers of the association are: G. G. Jury, traffic manager of Stout Air Services, president; Joseph F. Martin, manager of Clifford Ball, Inc., vice president; and Clifford Gildersleeve, United States Air Lines, secretary-treasurer.

Directors are: G. G. Jury, G. K. Murphy, E. M. Moore, H. R. Reitz and Bert Smith.

**A FLYING** school is to be opened soon by the Logan Aviation Co., airplane parts distributors.

Ground work will be taught at a downtown location and the flight instruction given at Cleveland Airport. The company is distributor for American Eagle planes.

**CONTRACT** for the construction of drainage sewers in the new section of Cleveland Airport has been let to Joseph Kalill & Jackson Co. Work is to start immediately.

The contract for construction of a 100-foot concrete apron in front of hangars facing the field is to be let soon.

**THE Cleveland Institute of Aviation, Inc.**, newly organized company, plans to open a flying school here capable of enrolling 1,000 students in three different flying courses.

Officers of the company are: Arthur H. Clark, president; Paul H. Mitchell, vice president and general manager; and Walter S. Ross, secretary-treasurer.

**CAPT. H. C. RICHARDSON**, a commander of one of the N-C boats which flew the Atlantic in 1919, is to resign from the Navy March 1 to become designing engineer for the Great Lakes Aircraft Corp., here.

The Great Lakes company is to spend \$400,000 for expansion to provide new building and equipment, and for grading and draining its flying field.

A contract was recently obtained by the company from the Goodyear Zeppelin Corp., of Akron, for the fabrication of parts for the two new navy airships being built there.

**DEWEY L. NOYES**, pilot for Clifford Ball, Inc., Cleveland-Pittsburgh air mail contractor, set a record for a round trip to Omaha recently. Favored with good winds he flew to Omaha and back, 1,500 miles, in 11½ hours' actual flying time.

He made the trip in a Whirlwind powered Ryan.

**WORK** has been started on the Universal Air Lines \$80,000 hangar at Cleveland Airport. It will be the largest there.

**THERE** were 17,600 arrivals and departures at Cleveland Airport during the last year, increasing from eighteen daily at the beginning to twenty-four daily in De-

cember. This port is now connected to all parts of the country by six airlines, and plans call for new hangars, and an increase of the landing space to eleven hundred acres.

### Thompson Absorbs Two Companies

**THOMPSON PRODUCTS CO., INC.**, of Cleveland, has announced the purchase of the Cleveland Piston and Mfg. Co., and the Cox Tool Co., both of Cleveland. The purchase will increase the products of the service division of Thompson Products from two to four lines, adding pistons and piston pins to motor valves and chassis bolts, and will increase the company's replacement sales by \$1,500,000.

This consolidation calls for a four-story addition to the Cleveland plant, which, with additions to the Detroit plant of the Thompson concern, will cost \$725,000.

**THE Floyd J. Logan Aviation Co.**, Cleveland, has recently taken on the distribution of the Rankin System of Flying Instruction for Ohio and the greater portion of the States of Kentucky, West Virginia and Pennsylvania. In the leading cities of that territory, the company will arrange with high class schools, either already located or to be formed, to give the Rankin System of Flying Instruction exclusively. The Logan company is opening a school at Cleveland. The company will use American Eagle and Travel Air planes.

**DAVID S. INGALLS**, president of the Cleveland National Air Race & Show Corporation, the organization who will handle the air races and exposition to be held August 24th to September 2nd, has announced the appointment of Cliff Henderson as managing director. The show will be held in the ten million dollar Cleveland Civic Auditorium. \$100,000 has been appropriated for the air race prizes. Complete announcements will be carried in our next issue.

**I**N response to misleading newspaper statements, the Advance Aircraft Co. of Troy announces the following as the officers of that concern: C. J. Brukner, president; L. N. Brutus, vice president and treasurer; L. E. St. John, secretary. These same men are all of the directors of the company, and own ninety-nine per cent of the stock.

### Flying Ambulance

**THE Henney Motor Company** of Freeport, Illinois, and the Great Lakes Aircraft Corporation of Cleveland recently completed plans for a new airplane ambulance. The airplane ambulance cabin will be six feet wide, ten feet long and five feet high, with accommodations for a nurse, interne, a wheeled cot for the patient and two pilots or one pilot and an extra passenger. It will have hot and cold running water, an electric fan, and ample drawer space for medical supplies and instruments and linen.

The ship will be equipped with a Pratt and Whitney Hornet engine of 525 horsepower.

(Continued on next page)



New factory building of the Le Blond Aircraft Engine Corporation.

*Number One of a Series  
of Fact-Statements Re-  
garding a New Industrial  
Leader—Great Lakes  
Aircraft Corporation.*



**WILLIAM ROBERT WILSON**  
—who as Chairman of the  
Board of Great Lakes Aircraft  
Corporation once more dis-  
plays the remarkable talent for  
organization and accomplish-  
ment which has long since be-  
come a tradition in automotive  
and financial circles.



# Responsibility

**I**T IS a significant fact that shrewd commentators on aeronautical matters already list Great Lakes Aircraft Corporation among the leaders of the industry. That such a position should be conceded even in advance of forthcoming production announcements is a remarkable tribute to the inherent *responsibility* of the Great Lakes organization. The frank confidence which has been placed in this

powerful newcomer is born largely of respect for the brilliant past records of its executives; the high expectations which it has raised throughout the industry are deep-rooted in the firm soil of a solid engineering and financial background. Aviation expects leadership from Great Lakes Aircraft Corporation because it is headed by men who have always been leaders—and because it is in business to stay.

**GREAT LAKES**  
AIRCRAFT CORPORATION CLEVELAND, OHIO



Military and Commercial Airplanes - - - Seaplanes and Floats - - - Aluminum Alloy Parts



(Ohio Air News continued)

### Akron Notes

By Walter E. Burton

**G**ROUND-SCHOOL courses in various aviation subjects are to be given at the Municipal University of Akron, Ohio. The university will cooperate with the recently organized Akron Air Services, Inc., which will operate an air school at the Akron Municipal Airport.

The University of Akron was one of the originators of the cooperative system of student training. Under the system, a student may attend school for a definite period, usually two weeks, and then may devote a like period to work in an industrial plant. In this way he gains both practical and theoretical knowledge.

The Akron Air Services, Inc., will provide all equipment.

Classes for both day and night students will be organized. Students will be required to meet certain standards before being admitted to classes.

During the first year, the enrollment will be limited to 100 students. No student who has not taken university ground courses will be admitted. The wearing of parachutes at all times during flights will be required.

The course will be 60 hours in length, and will qualify a student for a limited commercial license.

A hangar 100 feet wide and 80 feet long will be erected at the Akron Municipal Airport at once. The building will have two towers which will be devoted to office space, storage rooms, and pilots' quarters. On the top of each tower will be glass-enclosed observation platforms. In a nearby building will be a fully-equipped machine shop for servicing of planes and engines.

## CHICAGO AIR NEWS

By Duke Jordan.

**W**INSOR WILLIAMS, former assistant secretary of the Chicago Aero Commission, is now in charge of the American Air Transport Association's publicity office here.

**G**EORGE R. MYERS, formerly chief pilot for Interstate Airlines, has been made superintendent of airways of that organization.

**S**EVERAL Chicago pilots are planning to compete in the second American Legion Flying Congress to be held June 14 to 16 at Elkhart, Ind., under the auspices of Thomas McCoy Post No. 74 of the American Legion.

**L**IEUT. HART SMITH is busily engaged signing up students here for his flying school at Kenosha, Wis. Lieut. Smith has rented a store in the loop in Chicago.

**J**ACK OATES, Chicago distributor of Eaglerock airplanes, is broadcasting weekly flying lessons over WGN, the Chicago Tribune station, on Saturday afternoons at 5 p. m. Oates, with Jerry Weber,

is busy lining up a number of country clubs for flying lessons and the purchase of ships this spring.

**B**URT ISON has been appointed operations manager for the Chicago terminal of Universal Air Lines. Ison formerly was a pilot for the Robertson Aircraft Corp., between here and St. Louis.

**H**ARRISON & JORDAN, management engineers of this city, have been retained by the Alexander Aircraft Co., Colorado Springs, Colo., to survey production methods in the aircraft factory.

**G**LENEAGLES COUNTRY CLUB is organizing a flying club within its membership. A ship will be purchased and a pilot engaged to give instructions this summer.

**T**HAT flying interests Chicago newspaper readers was indicated in a survey conducted by a Chicago newspaper. The first 100 questionnaires returned to the newspaper revealed that 86 of that number liked an aviation column better than any other feature in the paper.

**E**STABLISHMENT of 150 branch ticket offices here is contemplated by the Chicago Air Traffic Association.

**F**LYING a Laird Commercial LC-R biplane and covering 350 miles in 1 hour and 48 minutes, Chas. W. (Speed) Holman set a new flight record between Minneapolis and Chicago. Holman, who is operations manager of the Northwest Airways, made the new record on a regular scheduled mail flight between the two cities.

**A**LL aviation schools conducted by the various divisions of the Universal Air Lines System, have been merged into a single chain, to be known as The Universal Aviation Schools. The Robertson School of Aviation, at St. Louis, now going into its eleventh year, is the oldest, one of the largest and probably the best known of the group.

It will now be possible to embody in each institution the best features of all, raising the standard of the entire group.

Besides the Robertson school, the Universal chain will comprise schools at Minneapolis, Cleveland, Chicago and Marion, Illinois.

W. B. Haviland, who was a member of the Lafayette Escadrille, has been chosen as director of the associated schools.

**W**HEN Mrs. Philip G. Kemp, wife of Major Kemp, vice president of the Universal Aviation Corporation, recently christened the Universal's new "sky diner," Miss Cleveland, at the Universal Airport, Chicago, the first airliner dining service out of Chicago was inaugurated. This Fokker F-10 is the first of a fleet of ten planes which will be put into operation by the Universal between Cleveland, Chicago, and the Twin Cities. A fully stocked pantry and galley will serve hot meals en route.

**B**LOXHAM AERO SUPPLY CO., of Chicago, has recently appointed the Robertson Aircraft Corporation of Anglum, Mo., distributor of the Bloxham Safety Stick. This safety stick is now standard equipment for the training planes of the Swallow, American Eagle, Lincoln-Page, Mohawk and other planes.

**T**HE students of Greer Airways, a subsidiary of the Greer College, Chicago, are constructing a Bryan B1B biplane.

Captain J. C. Bryan, with the collaboration of C. L. Laird, designed the plane. The B1B is a two-place job built for any power plant from 60 to 110 horsepower.

**J**OHAN R. CAUTLEY, head of the airplane division of the Bendix Brake Co., has been elected a director of the National Aeronautic Association.

**O**FFICERS who served in the air forces of the Army and Navy were entertained at the first annual aviators' reunion by Aviation Post 651, American Legion, in the Hotel Sherman, on February 22. Many men prominent in present day aviation attended the reunion.

**G**EORGE B. SCHIERBERG, secretary and treasurer of the Robertson Aircraft Corporation, has been named treasurer of the Universal Aviation Corporation, of which the Robertson firm is a subsidiary.

**S**CHAFFER OIL AND REFINING CO., maker of the Deep Rock lines of petroleum products, has appointed Richard C. Allen manager of the new aircraft division of the company. Mr. Allen was a former army pilot and a member of the famous Kosciuszko Squadron.

**A**ERICAN AIR TRANSPORT ASSOCIATION has published the first timetable of air travel. The twelve-page folder gives the arrivals and departures of airplanes in eighty cities. All regular passenger lines in the United States, Canada, Mexico, and the West Indies are listed.

**T**HE Robertson Aircraft Corporation, division of Universal Aviation Corporation, will shortly open a new branch in Chicago to handle all types of aeronautical supplies for the retail trade and for manufacturers. This branch, the first of a proposed chain, will be located in the Universal hangar at the municipal airport.

**C**APT. TREVOR G. WILLIAMS is the new manager of the northwest division of Northwest Air Lines. He succeeds Capt. Paul Goldsborough, who is now manager of the entire passenger division.

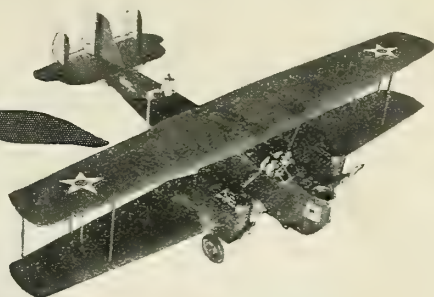
## ILLINOIS AIR NEWS

**C**ARY, thirty-eight miles northwest of Chicago, has a new sixty-five-acre airport. The Cary Aviation Company has erected a hangar, where gas is supplied, and a pilot is maintained for training.



# WANTED PILOTS

**Mechanics  
Repairmen  
Assemblers  
Engineers  
Builders  
Contractors  
Motor  
Experts  
Designers  
Instructors  
Salesmen**



## Let Greer Train You for a Big Future in AVIATION

Ask yourself this question: What will the aviation industry amount to in a year or so? And you know the answer—it will be America's most gigantic industry.

And question number two: Isn't it logical to assume that the men who get into aviation now will grow with the industry and be among the leaders "tomorrow?" We all know that to be so.

Even today, though aviation is still in its infancy, there is a big demand for pilots, for men in aviation factories—air transport companies—passenger and express service—air mail—barnstorming—aerial photography, motion picture work, crop dusting, etc. Opportunity! Fellows, aviation teems with it. Reason it out for yourself: thousands of passengers and tons of mail and freight are now being swiftly and safely carried all over the country daily. Manufacturers are all behind in supplying the demand for airplanes. Why? Because there are not enough men ready to step in and function in the various branches of the industry.

### GREER TRAINING MAKES YOU AN EXPERT

In the great seven and four story Greer shops you learn on actual equipment—no theory. And what training! You learn metal construction—wing building—woodworking—engine repair—acetylene welding—carburetors—ignition—complete airplane construction—rebuilding—repairing—meteorology and navigation.

Is it any wonder that students from all over the world are to be found in the Greer Shops?

### REAL FLIERS TRAIN YOU

Well-known fliers—men like Captain J. C. Bryan, with many years' Army and civilian flying instruction experience, C. L. Laird, and others who have made names for themselves in aviation—are the men who will supervise your training.

Why not insure yourself for a real future in this amazing industry?

### FREE FARE TO CHICAGO

When you enroll I'll pay your fare from any point in the U. S. And don't let the lack of money hold you back. We will assist you in getting employment while you are studying—and after you graduate assist you to get a still better position.

### RUSH COUPON FOR FREE BOOK

I want to mail you—free—my big aviation book. I want you to learn about the many remarkable and exclusive features of the Greer College. Learn why I say that when better pilots are trained, Greer will train them.

Never mind what you may think now—rush the coupon and get all the facts. No cost or obligation, so mail the coupon now.

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GREER COLLEGE, Dept. 3-K  
2024 S. Wabash, Chicago, Ill.

Please mail me free, your big aviation book and full details about your Training and Employment Service.

Name .....  
Address .....  
City ..... State .....  
Age ..... Occupation .....



# GROUND FLOOR WORK TO THE SKY'S LIMIT !



## DELAWARE AIR NEWS

**T**HE Bellanca Aircraft Corporation announces that R. B. C. Noorduyn, former assistant to Anthony H. G. Fokker, has been appointed assistant to the president, Mr. G. M. Bellanca, and chief executive. This appointment comes with the concern's construction plan which will increase production to a plane-a-day.

Born in Holland, Mr. Noorduyn has been identified with aviation since 1913 as an aeronautical engineer.

## NEW ENGLAND NEWS

By GEORGE W. HAMBLIN.

**T**HE first regular production of New England built airplanes was begun by Al Bourdon and Hank Kurt. They are now swamped with orders down at their Hills-grove, R. I., plant. The DH Moth is well under way up at Lowell, with plans for production scheduled for March first.

Sikorsky will shortly be located down at Bridgeport, Conn., along with the Avro Avian. Ted Kenyon is designing a two-place seaplane. And now, the latest is a two-place instruction ship, designed and constructed by a Boston boy, R. G. (Dick) Engel. The ship is entering its last stage of construction, and will be test hopped about March first. The test is to be run with a radically new motor. This motor, invented by C. A. Palmer of Boston, is a two-cylinder horizontally opposed type that develops eighty horsepower. It has no con-



R. B. C. Noorduyn

necting rods, no valves, and fires so rapidly that it sounds like an eight-cylinder engine.

**D**AN ROCHFORD, fellow scribe, and a good one, has got the idea that the National Air Races should be held in Boston in 1930, during the 300th anniversary of Boston. He has been going ahead with the idea, and has met untold obstacles. He has hurdled them, because he doesn't believe in bending backwards with conservatism. Give us a few more like Dan, and we'll get somewhere.

**A**DOLPH M. BACKSTROM, chief student instructor for Curtiss of New England at Boston, is hanging up a record for solo students that is rather amazing. In three winter months he has turned out fourteen students. The time averages six hours, or a little less.

**P.** H. SPENCER, formerly connected with the New England Aircraft Corp., of Hartford, is now sales manager for Curtiss of New England, and is in the Boston office of the company. It surely is good to have Spencer so handy, for the gang up here likes him a lot.

Frank LeMan has left the Curtiss company here in town, and Bill Harris is now traffic manager for Curtiss of Boston.

**S**KYWAYS, INC., with its new temporary hangar completed, is bounding along. Bellanca Aircraft has awarded the company the New England distributorship, and the American DH Moth is to be represented by the company in New England. What with Stearman, Challenger and Monocoupe, the company is well outfitted with ships.

Despite high winds and tough weather, Charlie Emerson and Jack Langley are putting in plenty of time with students and cross-country.

Crocker Snow has been elected president of the company and Ted Kenyon, who has been holding that office, is now chairman of the board of directors.

(Continued on next page)

# "How To Use Aviation Insurance Protection Economically and Advantageously"

## Insurance Protection Available

aggregates over  
**\$1,000,000 per aircraft**  
Constructive total loss  
Accidental Damage  
Fire, Tornado, Theft  
Cargo (direct and liability)  
Damage to ground property  
Airport and Airmeet liability  
Life insurance  
Public liability  
Property Damage  
Passenger liability  
Personal Accident  
Compensation  
and  
other forms constructed  
as required

**An Open Market**  
to all Insurance Companies, Reinsurers, Agents and Brokers. Standard conditions amended to meet special requirements.

... **I**s the title of our informative brochure. Ask us for a copy. It explains also our free advisory service founded on 20 consecutive years' practical experience in aviation and supported by our corps of highly qualified aeronautical engineers and our staff of executives, each one of broad practical experience in flying besides long training in insurance.

## GOOD SERVICE COUNTS

More aviation claims paid by our organization than by all other organizations throughout the world.

## Lowest Rates—Broadest Coverage—Highest Indemnities—Quickest Service

Policies have been issued over a long period of years, and among others in favor of Federal and State Governments, Boeing Air Transport, Colonial Air Transport, Colonial Western Airways, National Air Transport, Western Air Express, Northwest Airways, Walter T. Varney, Inc., Universal Aviation Corporation, Stout Air Services, Philadelphia Rapid Transit, Boston Aircraft Corporation, American Railway Express, Ford Motor Company, Fairchild Flying Corporation, Pittsman Aviation, Inc., Standard Oil Companies of New York, New Jersey, Louisiana and California, Shell Petroleum Corporation, Tidewater Oil Company, United Cigar Stores, Inc., Royal Typewriter Company, Pulitzer and other race meetings, Universal Motion Picture Corporation, Fox Film Corporation, Atlantic Aircraft Corporation, Bellanca Aircraft Corporation, Chance Vought Corporation, Lockheed Aircraft Corporation, Moth Aircraft Corporation, Pratt & Whitney, Sikorsky Aviation Corporation, Stinson Aircraft Corporation, Thompson Aeronautical Corporation, Goodyear Tire & Rubber Company, International Telephone & Telegraph Company, Radiomarine Corporation of America, Westinghouse Electric & Mfg. Company, California Standard Finance Corporation, Canadian Transcontinental Airways, Ltd., Western Canada Airways, Ltd., S. C. A. D. T. A. of Colombia, S. A., Andian National Corporation of Colombia, S. A., Maddux Air Lines, Transcontinental Air Transport, The Daniel Guggenheim Fund for the Promotion of Aeronautics, North American Newspaper Alliance, and many others, including Col. Charles A. Lindbergh, Sir Hubert Wilkins, Anthony Fokker, Lady Mary Heath, Miss Amelia Earhart, and other leaders in aviation.

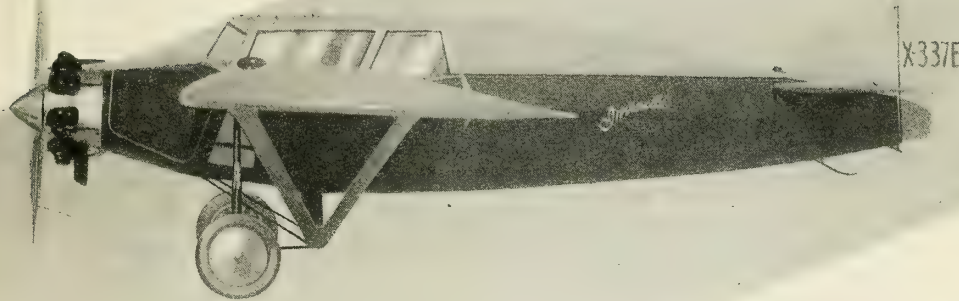
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**20 YEARS OF PRACTICAL EXPERIENCE IN AVIATION**

Say you saw it in AERO DIGEST

# Announcing the *Invincible*



## 3 and 4 Place Center Wing CABIN MONOPLANE

Remarkable performance in test flights reveals new travel luxury and effortless stability. Take-off in eight seconds on skis in two feet of loose snow.

The outstanding characteristics of the semi-cantilever type wing placed in the center of the propeller thrust develops highly efficient balance. Irreversible worm stabilizer control is operated from the cabin.

Ring-type engine mount facilitates the use of various size motors up to 180 H. P. LeBlond 90 H. P. and Curtiss Challenger 170 H. P. are standard equipment.

Unsurpassed visibility, front, sides, overhead and below. Dual wheel control, side by side; either wheel detachable. Hinge type throttle for left or right seat control. Navigation, power and lighting instruments controlled

from dash. Indirect lighting on instrument panel.

Comfortable, roomy cabin in two-tone velour upholstery. Streamline exterior of fine finish in tan shades. Under-carriage extremely sturdy. Efficient shock absorber and landing gear.

See the "Invincible" on exhibition at the Detroit Show and demonstration at landing field during the Show. Complete specifications mailed upon request.

Wing span.....38 ft. 8 in.  
Height.....7 ft.  
Length.....25 ft.  
Wheel tread.....6 ft.

Structure, chrome molybdenum steel tubing, wings wood, double internal bracing with steel tubing at compression. Full details mailed upon request.

Aircraft Division of the  
**Invincible Metal Furniture Company**  
MANITOWOC, WISCONSIN





(New England News continued)

Olcott S. Payson, stockholder of Skyways, and a member of the board of directors, is running the Portland Airport at Scarborough, which was leased from Curtiss Flying Service for the winter months.

THIS spring may see the first all-New England air tout,—I mean tour. The tour is being planned to take in all the New England airports, and end up in Boston on the opening day of a proposed aircraft show in the new Boston Garden.

Nothing has been released for publication on the tour as yet, because, well, just because the sponsors don't want any details published this early. More about it later.

UP here in frizzed-up Bawston the gang spends its time doing several things. The most important thing done this winter was the learning of the Morse Code by the inhabitants of the Bay State Flying Service's spacious office. Eddie O'Toole contributed a transmitting key and buzzer, and George Watkins and Harold (Waco) Crowley started in to give two lessons a day in the art of receiving the dots and dashes. It wasn't very long until the gang became quite proficient at it.

AT Muller Field, Revere, Bon Bon D'Arce is running an aero club. He has twenty-five members signed up, and has obtained seven students for the flying course of the Old Colony Airways out of the lot

AT a local meeting of the American Society of Mechanical Engineers held February 19 at Hartford, the principal subject of discussion was the design, production and maintenance of modern air-cooled aircraft engines. A. Willgoss, chief engineer of the Pratt and Whitney Aircraft Co., spoke.

THE Russell Manufacturing Co. of Middletown, Conn., has promoted Mr. J. M. Wilson, formerly of the Atlanta division, to manager of the Middletown, Conn., belting department.

MR. R. W. CONROY, formerly assistant manager of the San Francisco branch of the Russell Manufacturing Co., Middletown, Conn., has been appointed aero sales manager of the replacements department for that concern. The Russell Manufacturing Co. will soon open another factory at St. Johns, Quebec.

THE Evergreen Flying Club of New Bedford, Conn., has recently been organized and will operate in connection with the New Bedford Airport.

#### Worcester Air Notes

By Charles H. Chambers

THE Curtiss Flying Service of New England, Inc., has purchased the interests of the New England Aircraft Co., of Hartford, lessees of Whittall Field, the Worcester airport

The new company will continue the present activities at the Worcester airport, including the distribution of planes, instruction in flying, commercial photography, and aeronautical advertising. In addition the new company will arrange for the extension of the Curtiss aerial service lines to Worcester, Bridgeport, Boston, and Portland, Maine.

THE Curtiss Company at its new airport at Bridgeport has installed its New England airplane distributing base.

THE New England Aircraft Corp., was founded by Percy H. Spencer of Hartford, and George (Kitty) Barrows, both of whom are frequent visitors at the local airport. Mr. Barrows sold out his interest in the New England company in December. The New England company has been distributor locally of the Waco and Fairchild planes.

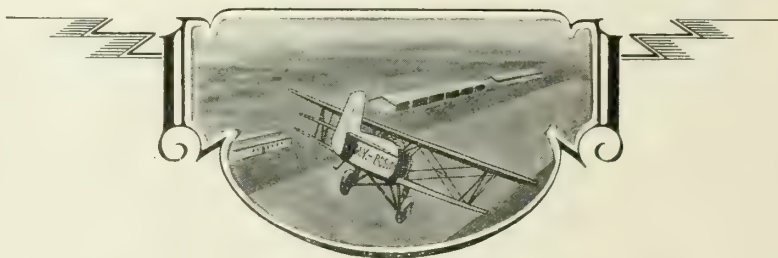
#### Springfield Notes

By Henry P. Lewis

CONSTRUCTION of a 30-foot semi-cantilever glider by a group of 22 boys and young men under the guidance of Fred W. Holmes of Westfield, Mass., has been progressing steadily during the past four months. The group is known as the Westfield Aero Club.

The machine has a chord of 5 feet and is 18 feet long. The fuselage is of the Pratt truss type and will be open. The materials

(Continued on next page)



## RELIABILITY



"Joe, I caught you at an awfully busy time, I know. I did want you to meet these men—big business men all of them. Thought you could fly over okay—you are right on the dot, too."

"Jim, that's the nice thing about my Stearman—worked at the office till the last minute—beat it to the air-port, there she was right on the job, and here I am. It's good to see you—let's go eat."

The STEARMAN AIRCRAFT CO.  
WICHITA, KANSAS

# Let your advertising cover the *entire* industry!

**Complete coverage is the only sure way  
to reach all new sales opportunities**

**T**HE expansion and growth of the aircraft industry during the past few years has created the necessity of purchasing millions of dollars worth of new machinery, buildings, tools and many other items. Material orders placed by aircraft and engine manufacturers have increased far beyond the expectations of a few years ago.

Men responsible for the purchase of these materials rely on up-to-date buying information. These men are regular readers of AERO DIGEST. They know AERO DIGEST to be the leading advertising medium in this field and naturally turn to its pages for assistance.

In order to handle the great volume of new business a great many new men have been swelling the ranks of aircraft workers and executives. They, too, naturally turn to AERO DIGEST for up-to-date news and information of the industry.

AERO DIGEST is read by more men actively engaged in the production and operation of aircraft than any other aeronautical publication. This large circulation which covers the entire industry dominates the aircraft industry. Today AERO DIGEST continues to lead all others (by a wide margin) in both circulation and volume of advertising.

The complete net paid circulation during the last six months of 1928 was 62,875 per issue. The print order for this issue is 72,500.

Let this circulation carry your advertising message to the maximum number of men who exert an influence on the purchases of your product in this industry.

An analysis of the circulation of AERO DIGEST both as to geographical distribution and as to types of men who read it will be cheerfully sent upon request.

## AERO DIGEST

THE MAGAZINE OF THE AIR

220 West 42nd Street, New York



*(Springfield Notes continued)*

used in construction are clear spruce, mahogany, plywood and sheet duralumin. The latter is used for the leading and trailing edges of the main wing. The aileron, flipper and rudder horns are made of plywood covered with dural shaped and sweated. Internal wing bracing is of piano wire with motorcycle spokes as strainers. There will be four external struts connecting the bottom of the wing and the fuselage.

Jigs essential for accurate construction of the wing ribs were designed and built by the club members.

When completed, the machine is expected to weigh approximately 150 pounds. The glider will probably be tested at Barnes Airport in Westfield.

The club has already started preliminary work on the construction of a single-place low-wing monoplane which is to be powered with an engine of from 25 to 35 horsepower.

Meetings of the club are held two or three times weekly.

**PARTICIPATION** of the Springfield newspapers in the second annual airplane model tournament conducted by the *American Boy Magazine* has been announced, and articles explaining the construction of airplane models have started. A large number of model clubs have been formed.

The Springfield newspapers are offering three free trips to Detroit to be awarded to the boys who attain the highest ratings in the three divisions of the contest. The scale model contest this year has been opened to boys and girls resident in any of the four western Massachusetts counties. The contest is again in charge of Henry P. Lewis, aviation editor of the *Springfield Union*.

**THE** second semester of the State University extension course in aeronautics covers advanced studies in the theory and practice of flight, airplane engines, rigging, meteorology, navigation, etc. The class meets weekly in the Technical High School.

## RHODE ISLAND NEWS

By THOMAS F. BRESNAHAN

**THE** Bourdon Aircraft Company at Hills-grove, manufacturer of the Kitty Hawk, three-place open-cockpit plane, to date has turned out eight planes and production plans for the future call for the building of one plane a week. Mr. Allen P. Bourdon has announced the building of his first amphibian.

**A** FLYING club will be formed by the men attending the North Attleboro Aviation School. The idea of the club will be to get 50 members and charge a nominal sum for membership. This fund, together with money derived from smokers and entertainments, will be used to purchase a plane and to pay for an instructor in actual flying. The school teaches only the ground course.

**TEN** model airplane clubs have been formed in Providence under the Providence Junior Achievement Foundation. Lead-

ers for the club are being trained under Samuel Presel, Providence designer and model airplane expert.

**RHODE ISLAND'S** first real school of aviation instruction opened in Providence at the Biltmore Hotel under the auspices of the Providence Airport Corp. Franklin T. Kurt, Allen Bourdon, Jesse K. Fenno and Miles Standish were the speakers at the first meeting. Mr. Kurt will be chief instructor.

**THE** introduction of a resolution providing for the appointment of a legislative commission to recommend the choice of a site for the state owned airport will be made soon in the Rhode Island General Assembly.

**OFFICIALS** of the Curtiss Flying Service of New England, Inc., have been inspecting Rhode Island fields with the announced intention of establishing a stopping place for their planes.

**THE** Providence Safety Council, the first in the country to create an air traffic division, has appointed a committee on air traffic for the coming year. Members of this committee are W. H. Perry and M. L. Falk two war-time fliers; J. E. Bullard, in charge of the air division; William B. Spencer, Col. John B. Coleman, Adj. Gen. Arthur C. Cole, George H. Armitage of the Little Rhody Aero Club and Allen P. Bourdon.

**THE** flying field at Westerly is soon to be illuminated with powerful floodlights and a Neon beacon.

**THE** project of a joint municipal airport to serve North Attleboro and Attleboro has been definitely dropped by the Attleboro Chamber of Commerce because of the lack of interest on the part of North Attleboro people. Attleboro will attempt to develop a site of its own.

## STANDARD'S AVIATION BOOKLET

**"IT'S EASY TO FLY"** is the title of the latest booklet brought out by the Standard Oil Company of New York, as a sequel to "Know Your Car." The booklet considers briefly the elementary principles of airplane construction, flight, and lubrication. It names and illustrates the various parts of a plane. The types of engines are illustrated, with brief discussions of streamlining, flight, control, and instruments. The booklet closes with a list of aeronautical terms and meanings, followed by a lubrication chart.

## THE DIESEL ENGINE FOR AIRCRAFT

**L. M. WOOLSON**, aeronautic and research engineer for the Packard Motor Car Co., in his article in the February issue of the "S. A. E. Journal," discusses the Diesel engine for aircraft use. As a result of his experiments in the Packard lab-

oratory with this engine, he believes that this engine is reliable, that there is less fire risk, and that fuel cost is reduced seventy per cent as compared with the present gasoline motor.

In the engine he has successfully tested in the laboratory and in flight, Mr. Woolson reports, the engine weighs less than three pounds per horsepower, operates at compression ratios as high as eighteen to one, and at engine speeds from seventeen hundred to two thousand revolutions per minute.

## DETROIT AIR NEWS

By FRANK BOGART.

**CURTISS FLYING SERVICE, INC.**, of Michigan, has started its preliminary course of lectures, with 125 students registered. The ground school at the Grosse Ile airport will probably open in May.

**THE** first of March, Stinson Aircraft Corporation will move into its new 80,000 square foot plant on the Detroit-Wayne Industrial Airport, a mile square field, one-half of which is used for landing space and the rest laid out in factory sites. Ralph Fordon, president of the Detroit Stock Exchange, has been added to the Stinson directorate.

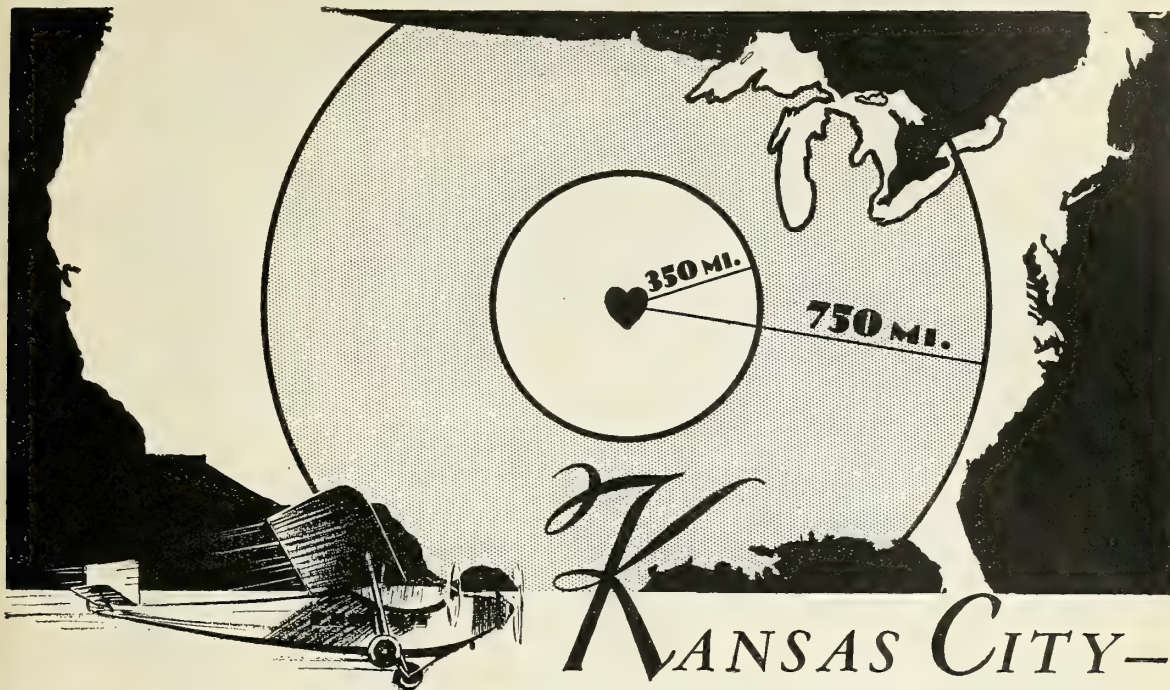
**WORK** has started on a new plant for Warner Aircraft Company, makers of the Warner Scarab engine. Dr. Claude Donier, who has sold three of his 25-passenger Super-Wals to the Detroit and Cleveland Navigation Company, for operation on the Great Lakes, starting in June, was a visitor during the last half of February. The Stout Air Services, Inc., will operate the fleet for the boat company.

**THE** Detroit area will have another new mile square port, 15 miles north of Detroit City Hall, to be owned and managed jointly by five suburban communities. The airport is at Maple Road and Coolidge highway, in the village of Birmingham, Oakland County, Mich.

**A**FFAIRS in the Detroit city council respecting the development of the municipal airport and the building of hangars and exhibition building there, the latter to be the permanent home of the All-American Aircraft Show, are still in an uncertain stage. The council is trying to get some plans for a hangar that will keep the cost down to \$1,000,000. Perhaps the plans will be finished and approved in time for the steel work to be under way when the aircraft show opens April 6.

**THE** first directors' meeting of the National Gilder Association, formerly the Evans Gilder Clubs of America—Edward S. Evans, president—was held here February 6. It was announced that college students are turning to the new sport and science of motorless flying. The directors include Prof. F. W. Pawloski of the University of Michigan Aeronautical Engineering School and Prof. Alexander Klemm of New York University.

(Continued on next page)



## The Hub of Air Transport

AT the hub of the market for aircraft and aviation service—the center of vast distances where the airplane provides its greatest utility—the midway terminal of transcontinental air transportation systems—the central gathering point for the winged carriers of the nation who are the heaviest buyers of planes for air mail and passenger transport—Kansas City and the Middle West is

fast becoming the flying instruction center of the United States, providing another vast market—private owners of aircraft are also purchasing planes to use where they fulfill their maximum service—23.3 % of all licensed aircraft in the United States are now within a radius of 350 miles of Kansas City—53.7 % within a radius of 750 miles—Kansas City—Heart of America—Hub of the aircraft market!

Literature will be sent only when this coupon is attached to your business letterhead. If not desirous of revealing identity at present, it is suggested that your banker or lawyer may obtain the book for you.

### Not just a city but an empire

Kansas City advertising does not confine itself to corporate limits. Within the territory are raw materials and manufacturing advantages of a highly diversified nature . . . many within the city itself, many in the smaller cities of this rich area. Kansas City undertakes to tell the story of the entire territory to interested manufacturers, realizing that the city prospers only as its outlying territory prospers.



Chamber of Commerce of

# KANSAS CITY

Kansas City, Mo.

Industrial Committee, Room 37  
Chamber of Commerce, Kansas City, Mo.

Please send me without obligation "The Book of Kansas City Facts." I am especially interested in information on the following subjects:

☐ Reduced Production Costs    ☐ Air Transportation    ☐ Flying Schools    ☐ Aircraft Market

Name..... Business Title.....

Address..... Nature of Business.....

City..... State.....



(Detroit Air News continued)

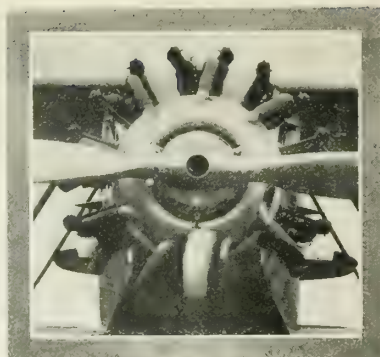
**R**ALPH R. IRWIN, president of Aircraft Products Corporation, formed 10 months ago, reports that 12 of the leading airplane manufacturers are buying struts, wheels and other products from that firm.

**R.** V. KENT, formerly a pilot for the Ford Motor Company and instructor of the Aircrafters' Club, a high school flying organization, has gone to Mexico as operations manager of a mail line between Merida, Yucatan, and Brownsville, Texas.

**PROF.** PETER ALTMAN, head of the aeronautical courses at the University of Detroit, announced in February a new course in radio in connection with aircraft. J. E. Miller, formerly at Elberts and Kelly Fields, will conduct the course.

**A** GAIN this year the Berry Brothers' booth at the Detroit show, April 6-14, will be a service center for customers. Ten members of the aviation division will be on hand to assist manufacturers with last minute touch-up work and help in every way they can to make the ships look their best.

Tom Colby, manager of the aviation division; Tom Murphy, assistant manager; Herb Longacre, Philadelphia; Art Clark New York; Ed Berry, Wichita; G. E. Stanton, Little Rock; Bob Sapper, Cincinnati; Lloyd Hasty, Chicago; Louis Pereny, aviation chemist; and H. J. Heindell, practical demonstrator, will attend.



Buhl Stamping Co. exhaust collector

**D**WIGHT DAVIS has been appointed assistant to the president of the Schlee-Brock Aircraft Corporation of Detroit, according to Edward F. Schlee, president of the organization. In this position Mr. Davis will have the supervision of sales promotion and advertising for the company.

#### Buhl Stamping Company

**T**HE Buhl Stamping Company, of Detroit, for more than 40 years a producer of fine metal stampings, has created an aircraft division. A generous proportion of the big plant has been given over to this newest unit, which at present is manufacturing parts for a majority of the well-known aircraft engine manufacturers.

Closely allied with the Buhl Aircraft Com-

pany, the Buhl Stamping Company is in a position to enter this field with great familiarity.

Two of its new products are the airplane exhaust manifold and nose cowl which were exhibited at the New York aeronautical show. The aircraft division will include all the metal stampings required in the industry.

In addition to the Buhl Stamping Company and the Buhl Aircraft Company, the allied Buhl interests include Buhl Sons Company, wholesale hardware firm, and the Buhl Building, prominent among the tall structures in the financial district of Detroit.

#### All-American Aircraft Show

**W**ITH space for nearly two hundred displays already requested, with fourteen landing fields and servicing conveniences mapped out, and a public school contest arranged to create interest, plans for the All-American Aircraft Show are progressing. Convention Hall, with four acres of display room, will be the center of attraction, and additional space will be procured nearby to augment the show facilities.

The observance of Aviation Week, April 6-14, during the show, is being sponsored by the Aeronautical Chamber of Commerce of America, Inc., and the Detroit Board of Commerce.

**"AIRCRAFT** Radio Communication" is the name of the latest addition to the aeronautical curriculum of the University of Detroit. This course, introduced in the

(Continued on next page)

## CONSTRUCTION OF MULTIPLE-ENGINE METAL AIRPLANES INCORPORATING DESIGN FEATURES OF THE BURNELLI TYPE



# V. J. BURNELLI

### AIRCRAFT CONSTRUCTION

**Factory:**  
**Keyport**  
**New Jersey**

**Office:**  
**247 Park Ave.**  
**New York City**

# SPARTAN

## Designed to *Be Safe* Built to *Stay Safe*

**N**OT merely a slogan, but a principle in which the personnel of Spartan Aircraft Company has been rigorously schooled. As a result every individual in the Spartan organization has a keen sense of responsibility in the design and construction of better airplanes.

Last year's performance must be eclipsed. Last year's engineering must be surpassed. Distinctive additions must be made in both beauty and safety; quality must come before quantity.

Spartan Aircraft Company recognizes that upon the ability of the manufacturer to meet these standards depends the measure of confidence he will inspire for his product.

For that reason the name Spartan and the winged head of the Spartan warrior have gained recognition as symbols of speed, dependability and utility in aircraft. The current year will demonstrate, also, that Spartan has not sacrificed to other important factors that of safety---a factor which, in Spartan, has proved itself the nearest thing to the human element that can be built into a modern airplane.

**SPARTAN**  
AIRCRAFT COMPANY

Tulsa, Oklahoma



(Detroit Air News continued)

second semester, is probably the only one in the country entirely devoted to the problem of radio navigation and communication on aircraft. J. E. Miller, formerly of the Army Air Service, will conduct the classes.

**WHITMAN BARNES-DETROIT CORPORATION** has added to its chemical and metallurgical staff Mr. Walter R. Breeler, research metallurgist. Mr. Breeler read a paper at the last convention of the American Society for Steel Treating which attracted wide attention.

## MICHIGAN AIR NEWS

Thompson Record

**T**HE Thompson Aeronautical Corporation, CAM 29, air mail contractor on the Bay City to Chicago route, during its first six months of operation carried 73,903 pounds of mail in planes which flew 77,249 miles or 97 per cent of the mileage scheduled. During the whole of its existence, both as an air mail contractor and a year's previous operations from the Cleveland Airport, TAC has never had a serious accident and has never injured a pilot or passenger.

**WOLVERINE FLYING SERVICE,** Lansing, is the newly appointed dealer of Lockheed Vega airplanes for all the State of Michigan, excepting Wayne County, according to Edward F. Schlee, president

of the Schlee-Brock Aircraft Corporation of Detroit.

The Wolverine Flying Service has a modern hangar with space for fifteen planes at the Lansing Municipal Airport. The Service has the following officers: M. M. Scott, president; Hugh Daily, sales manager; Austin R. Narrin, operation manager.

**ROYAL OAK FLYING CLUB,** of Royal Oak, Mich., has grown steadily since its organization in the fall of 1927. This club, under the leadership of Sergt. D. T. Carroll, has a hundred-acre landing field, a Waco-10 plane, and a well constructed hangar. Mr. Paul Eberle is instructor for the club.

**PONTIAC'S** new modern airport is now nearing completion. Meeting the requirements of the Department of Commerce's "A" rating, the airport is considered outstanding in its complete lighting system which is up-to-date in all details.

## BERRY FINISH CLEANER

**A** NEW product—Berryloid Aeroclean Polish — is announced by Berry Brothers, Inc., Detroit manufacturer of varnishes, enamels and lacquers.

This new material wipes away oil or dirt and adds months of wear to a lacquer or varnish finish. Berry Brothers officials state that this polish is absolutely safe—will not penetrate the dope—and actually sheds dust.

## ON CURING THE DEAF BY AIRPLANE DIVES

**I**N view of frequent news dispatches of airplane dives taken by deaf persons in the hope of recovering their hearing, and in some cases the statement that hearing was restored, a question has been asked the Washington University School of Medicine—"What, if anything, deaf persons could expect by such drastic procedure?" The answer given by an assistant professor of laryngology was that it was totally illogical to expect that hearing could be restored or even bettered by airplane dives. "The ear is one of the most complex organs of the human body," the assistant professor said, and, incidentally, he is one of the best known private practitioners on the subject in the city. "How complex is indicated by the fact that the spiral ligament in the labyrinth of the ear is composed of 24,000 fibers, and the spiral ligament compared with the whole mechanism of hearing is as a screw to a dirigible. Hearing is impaired or destroyed only by the destruction of some material portion of this intricate mechanism. Once destroyed, no human agency can restore that portion. So, in effect, what one who plunges in an airplane is expecting is that something that is gone will be brought back. It would be as sensible for a one-legged man to plunge and expect, when he reached the ground, that he would have two legs.

"There is one exception. That is hysterical deafness. The treatment there is identical with treatment in general hysteria—heroic—sudden shock or fright."

**BUY WITH  
CONFIDENCE**

**FLY WITH  
CONFIDENCE**



**A RELIABLE  
DISTRIBUTOR**

— SELLING —

**A RELIABLE  
AIRPLANE**

**WHY YOU SHOULD BUY A WACO**—The WACO has both Commercial and Sport advantages such as, Superior Performance—Beauty—Simplicity—and Many Records to its credit.

**WHY YOU SHOULD BUY FROM ROBBINS**—Low delivery cost—Exceptional service facilities—FREE, COMPLETE COURSE OF INSTRUCTIONS WITH EACH WACO PURCHASED.

Act now for your success in the greatest year of Aviation.

If not interested in a plane—Investigate our Flying and Ground School

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**ROBBINS FLYING SERVICE** Akron, Ohio

# an IDEAL MATERIAL FOR HANGARS



*..it is much more permanent than ordinary corrugated metal . . . . .*

*..it costs much less than "heavy construction" . . . . .*

*RPM hangars can be enlarged, moved, taken down or re-erected*

HERE is a material for hangars that is the happy medium between short-lived, unprotected metal roofing that rusts away before your very eyes . . . and the so-called "heavy construction" that costs far too much, and that cannot readily be changed, enlarged, or moved (and this last is a serious thing in a business that is changing and growing the way aviation is).

This ideal material that avoids the shortcomings of both the other kinds of construction is Robertson Protected Metal (RPM).

It is a solid steel sheet, corrugated for strength, and so skillfully protected with EXTERNAL coverings, that it is rust and corrosion-proof, and does not require painting or any other maintenance.

It is so economical in price that a hangar of RPM will often cost less than half of "heavy construction." Yet it will last for years and years and years without any attention.

It can be erected as easily and as quickly as the old unprotected metal. It can be taken down and moved across the air field, across the city, across the country . . . and erected again. For any additional information about RPM, write to

H. H. ROBERTSON COMPANY • PITTSBURGH, PA.

# ROBERTSON

*Has the Experience*



*A Hangar covered with RPM at the Municipal Flying Field, Chicago, Illinois*



## ST. LOUIS AIR NEWS

### Approved Type Certificate for Six-place Ryan Brougham

THE Department of Commerce, Aeronautics Branch, has issued approved type certificate No. 104 for the new Model B-3 six-place, dual control Ryan Brougham.

The Mahoney-Ryan Aircraft Corporation announces also the placing of an order for 33 Wright J-6 Whirlwind engines of 225 horsepower to be used in the new planes.

OF the two new hangars to be built at the Von Hoffmann Aircraft School, one will be devoted exclusively to the ground school and will include offices, lecture hall, machine and woodworking shops. The large hangar now housing the ground school will be used to store planes belonging to the Von Hoffmann school as well as to provide garaging and storing facilities to resident and transient plane owners.

A second new structure in the new unit will provide living quarters for 100 students of the Von Hoffmann school and will include dormitory, shower baths, dining room, recreation and study rooms.

In addition to the two major units, a smaller hangar will be erected for the use of the mechanical force of the Von Hoffmann Aircraft Company for repairing and servicing resident and transient planes. Wing doping will also be done in this building.

Construction of these additional buildings is scheduled for completion by April 1st.

MR. J. A. Van Loon has been appointed sales manager of Parks Aircraft, Inc., with headquarters at Parks Airport. Mr. Van Loon was formerly wholesale manager of the Oliver-Cadillac Co.

PHOTOGRAPHIC supplies costing \$10,000 have been ordered by the Parks Air College in preparation for the opening of its new course in commercial and aerial photography to begin March 15. The course will be seventeen weeks long, and will take up map making, mosaic composition, and oblique photography.

### Gardner Trophy Race

WITH all types of commercial airplanes with engines of not more than eight hundred inch displacement eligible to enter, the details of the Gardner Annual Trophy race at St. Louis on May 28th and 30th are completed. Speeds of more than 120 miles per hour are expected from the winners. There will be no limitation on the designs of the entering planes.

Racing for the prizes totaling \$10,000 given by Russell E. Gardner, Jr., and Fred W. Gardner, brothers at the head of the Gardner Motor Car Co., the contestants will make a preliminary race to St. Louis from Buffalo, Jacksonville, San Antonio, Denver, and Fargo, on May 28. The two leaders from each starting place will receive prizes of \$750 and \$250 respectively, and will be entered in the final race. On May 30 the

ten preliminary winners will race to the Indianapolis speedway, turn a pylon over the Memorial Day races there, and fly back to St. Louis. The winner will receive \$5,000.

UNIVERSAL AVIATION CORPORATION, with changes and improvements in the curriculum, has raised the tuition of the Robertson Flying School to make the rates and courses in its schools uniform. Night classes will be started, and an aviation business course will be added to the courses.

TENTATIVE establishment in St. Louis of the headquarters of the Universal Aviation Corporation has been announced with the leasing of offices in the Boatmen's Bank Building for executives of the company. The offices will be in charge of Col. Halsey Dunwoody, former assistant to Russell E. Gardner, Jr., president of the Gardner Motor Company, who has been appointed executive vice president of the corporation. W. B. Haviland, who has charge of the flying schools operated by Universal, will have his headquarters here, at least temporarily. The traffic department of the Robertson Aircraft Corp., will be moved to the Boatmen's Bank suite.

HARRY H. PERKINS has been promoted from secretary to vice president and general manager of the Robertson Aircraft Corporation.

## Dry Landing Fields in One Tenth the Time!

DRAIN pipe for airports must be able to withstand the crushing impact of heavy planes when landing. If it is laid with open joints, which soon clog and greatly reduce drainage capacity, it is especially unfitted for the purpose. If it is only occasionally perforated with holes, it is rendered almost useless when those relatively few holes clog.

"Poroswall" Rapid Drain Pipe is a concrete pipe. It has all the strength\* and permanence which such construction insures. But it is not occasionally perforated but is porous throughout every square inch of its wall-area. As a result, water gently seeps through its walls without carrying clogging material along with it. Therefore, drainage is ten times faster.\*\*

\* "Poroswall" strength is always far in excess of A. S. T. M. requirements.

\*\* "Poroswall" infiltration-capacity averages five gallons per square foot of surface per minute (Columbia University Testing Laboratories).

Drainage  
Engineering  
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Demonstrator  
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Literature.

**WALKER  
POROSWALL  
RAPID DRAIN PIPE**

"The Water  
Seeps in  
and Flows Through"

Walker Cement Products,  
Inc.  
Little Ferry, N. J.

*Under the Best-Drained Airports!*

# A Vital Message to SCHOOLS

**Cut Instruction Prices... yet  
Double-up on Profits!**

**You Can  
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*The Monoprep*

**M**AINTENANCE and operating costs of the MONOPREP are but a mere fraction of the expense attached to the average training plane.

That's why schools with Monopreps on the line can offer student training for less money and still enjoy larger profits than their competitors.

Often the same purchase money puts two *Monopreps* instead of a more expensive plane into service, which means two students in the air during the same hour. The side by side training permits the instructor to cover each lesson thoroughly *while the student is in the air*. This feature alone saves hours of time.

The MONOPREP embodies every qualification desired in a training plane.

*Inquiries are invited for distributor  
and dealer franchise contracts. Write  
or wire today for full information.*

**MONO-AIRCRAFT, Inc.**

Builders of the Monocoupe, Monocoach and Monoprep  
Moline, Illinois, U. S. A.

**Especially  
Designed  
for  
Economical  
Training**

## Note these Monoprep Features—

Perfect vision all directions.  
Oildraulic landing gear struts.  
Two doors.  
Friese type ailerons.  
High lift wing.  
Slow landing speed.  
Gas consumption 4 gals. per hr.  
Five hours fuel.  
Flyaway price \$2675.

**Increased Enrollment  
Accrues to the School  
with the MONOPREP**



## KANSAS CITY AIR NEWS

By H. H. JAMES.

**ERLE H. SMITH**, for the last three months sales promotion manager of the American Eagle Aircraft Corporation, has been promoted to advertising manager of that company. He will continue also in the dual capacity of sales promotion manager.

**THE** Pennsylvania Petroleum Company has a new Neon sign on top of its plant in North Kansas City, near the municipal airport. The sign is 92 feet in length with letters 12 feet 8 inches high. It can be seen farther than the field beacon of several million candlepower, and is especially noticeable during unsettled or foggy weather.

**ROBERT F. MILLER**, St. Louis, youngest member of the state legislature, is to offer a series of bills in the lower house that include the creation of a department of aviation in the state; the curtailing of stunt flying; regulation of inter-state passenger services in planes; inspection of all planes and qualifications for commercial pilots.

**THE** Southwestern Bell Telephone Co., is erecting four beacon lights on top of its 28-story building, the lights being 700 feet above the municipal airport.

**THE** Porterfield Flying School, subsidiary of the American Eagle Aircraft Corporation, set a new record recently with the enrollment of twenty-three new students in one week.

**SUB-ZERO** weather, accompanied by a series of blizzards, has delayed work on the American Eagle Aircraft Corporation's new factory at Fairfax Airport. Plans to start production at the factory February 1 had to be abandoned. It will be near the first of March before the new factory is ready for operation.

**THE** airplane industry made a bid for interest alongside the automobile. Four airplanes were on display at the Kansas City Automobile Show. The American Eagle exhibit included a completed plane and a "stripped" model. Other exhibits were by the National Air Transport, Inc.; Beacon Airways of America, and the Bennett Eaglerock Sales Company.

**THE** Kansas City chapter of the National Aeronautic Association has changed its name to the Aviation Club of Kansas City.

**MARK W. WOODS**, president of the Woods Brothers Corporation, is also president of the Arrow Aircraft and Motor Co., Lincoln, Nebr. He says the company plans to build at least 300 Arrow Sport planes this year.

**ROY C. FARRELL**, has been appointed manager of the Kansas City Municipal Airport by H. F. McElroy, city manager. Mr. Farrell graduated from the school of aeronautics at the University of Texas and also served in the Army Air Corps during the World War.

**THE** American Eagle Aircraft Corporation reports the closing of fourteen new dealer contracts as follows: Harry J. Scherff, Kansas City; C. C. Kindred, Smithville, Mo.; A. L. Enlow, Leavenworth, Kans.; H. C. Havener, South Bend, Ind.; W. Nodasay, South Bend, Ind.; R. Elmer Minton, Lafayette, Ind.; H. C. Wasson, Los Angeles, Calif.; M. G. Gilkersohn, Los Angeles, Calif.; J. E. Chambers, Rock Island, Ill.; J. M. Schabb & Son, Rock Island, Ill.; Lowell R. Whilta, Wellsville, Kans.; H. A. Chapman, Battle Creek, Mich.; D. P. Fisk, Kalamazoo, Mich., and Harold Worthington, Kalamazoo, Mich.

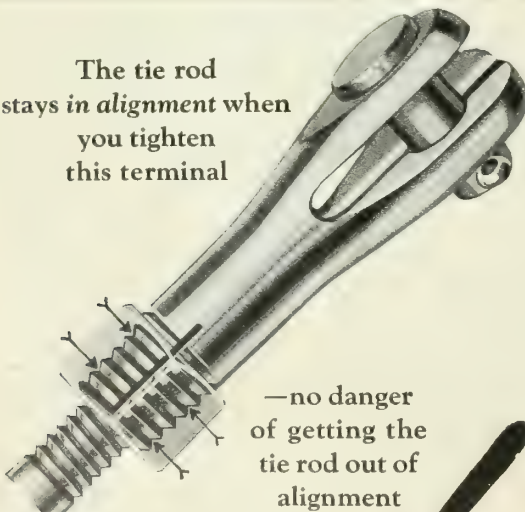
**THE** three commercial planes of Commercial Airways, Inc., have operated without a single accident, covering more than 100,000 miles in a flying time of 1,250 hours.

**THE** Bredouw-Hilliard Aeromotive Corporation, headed by Homer L. Bredouw and Kenneth V. Hilliard, has been designated by the Wright Aeronautical Corporation as its official service station for the Kansas City area. Hilliard has been with the National Air Transport, Inc., since its organization. Bredouw was an army flier in the World War.

**THE** Bennett Flying School here is offering a 10-hour solo flying course for college students in this territory participating in the contest in the Alexander Eaglerock contest.

(Continued on next page)

**The tie rod stays in alignment when you tighten this terminal**



—no danger of getting the tie rod out of alignment

**MACWHYTE**  
Safe-Lock  
Terminals for Tie Rods

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Macwhyte Company, 2907 Fourteenth Ave., Kenosha, Wisconsin. Makers of  
**Streamline and Round TIE RODS**



**STANDARD AUTOMATIC PRODUCTS CO.**  
ORIGINAL MANUFACTURERS OF  
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Airplane parts of merit  
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CLEVIS PINS, AIRCRAFT BOLTS**  
(milled from bar)

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Army and Navy and many  
airplane manufacturers**

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## Uncle Sam Trains His Flyers in San Antonio...WHY?

HOME STUDY COURSE.....\$ 15.00  
 PRACTICAL SHOP COURSE..... 50.00  
 SHOP and GROUND COURSE..... 100.00  
 Given by Southern College of Aviation.

\* \* \* \*

SOLO COURSE (Not over 10 hours).....\$150.00  
 Terminating in one hour solo flying.  
 Time required, approximately one month.

\* \* \* \*

ADVANCED or 15-HOUR COURSE..... \$250.00  
 Time, approximately six weeks.

\* \* \* \*

PRIVATE PILOT'S COURSE, 20 hours ...\$325.00

\* \* \* \*

COMMERCIAL PILOT'S COURSE.....\$750.00  
 Time, approximately ninety days.

\* \* \* \*

TRANSPORT PILOT'S COURSE.....\$2,000.00  
 Two hundred hours.

\* \* \* \*

Board and room can be obtained at prices varying from eight and ten dollars per week up.

All students registering and paying their tuition before April 1st, will receive helmet and goggles free.

We will refund railroad fare or its equivalent to all commercial and transport students registering before April first.

References: Guaranty State Bank; S. A. Chamber of Commerce; S. A. Chapter National Aeronautic Ass'n.

## SAN ANTONIO AVIATION AND MOTOR SCHOOL

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**SOUTHERN AIRWAYS, Inc.**

MOTORS — AIRPLANES — PARTS — SUPPLIES

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SAN ANTONIO, TEXAS

*Ideal Field—Perfect Flying Climate—New Licensed Equipment—Licensed Instructors—Practical Shop Work. All Personally Managed by Executives with Ten Years of Success in Airplane Transportation, Manufacture and Flying Training.*

**Flying Winter and Summer**



In March and April, while much of the world only dreams of Spring, San Antonio glories in all the wonders of warm days and perfect flying weather.



(Kansas City Air News continued)

**A**CCORDING to an agreement between the Curtiss Flying Service and the Wood Brothers Corporation, managers of the airport, Fairfax Airport will be the headquarters for the four-fold service of the Curtiss organization—the school of aviation, taxi service, sales service, and aviation development.

The instruction units of the school will consist of four brick and steel hangars, each 100 by 100 feet, with a two-story addition for class rooms and laboratories. Near the school, dormitories for the use of the students will be erected.

The Woods Brothers Corporation will furnish recreation, by laying out a baseball diamond, tennis courts, etc. The company will also provide a building to house a barber shop, confectionery, haberdashery, and similar establishments.

**T**HE custom built twin-engined cabin monoplane, constructed for Dr. Walter M. Cross, a Kansas City chemist, by the American Eagle Aircraft Corporation, recently underwent initial tests at Fairfax Airport, Kansas City, Kans.

Piloted by Howard Jones of Wichita, Kans., the big monoplane powered with two Siemens-Halske 125 horsepower motors, took off in about 200 feet and showed a cruising speed of approximately 90 miles an hour with the motors throttled down to about three-fourths of their normal r.p.m.

The monoplane has a wingspread of 47 feet and an overall length of 27 feet 6

inches. It weighs approximately 1,700 pounds and its useful load is about 800 pounds.

**T**HE American Eagle Aircraft Corporation now is issuing a newspaper for employees of the company called "The Eagle's Nest." Earle H. Smith, formerly assistant to the managing editor of the Kansas City *Journal-Post*, is the editor.

**K**ANSAS CITY will give the "Heart of America Aircraft Show" sometime during the coming summer, having received the sanction of the Aeronautical Chamber of Commerce. In order to feature the "all the way by air" slogan, the officials of the show will give free display space to planes flown there by manufacturers.

**T**HE Universal Air Lines System has opened a traffic office in Kansas City in the Board of Trade Building. It is under supervision of Mr. G. R. Smith.

**C**OLORED floodlights along the Missouri River will beautify Kansas City from the air if the adopted proposal of the local chapter of the National Aeronautic Association is put into effect. The colorful lighting would stimulate interest in aviation in Kansas City, it is believed.

The lights will be an additional help for fliers in locating the bend in the river and the position of the municipal airport on one side and Fairfax Airport on the other.

**A** SIX-CYLINDER, two-row radial engine will be put on a production basis this spring, by the American Eagle Aircraft Corp., according to an announcement by E. E. Porterfield, Jr., president of that concern.

## MISSOURI AIR NEWS

**N**ICHOLAS-BEAZLEY AIRPLANE CO., of Marshall, has established a Mexican depot and representative in Mexico, —Mr. G. N. Anderson, president of Cia Suriana del White. This concern will be the first in Mexico actively to enter the airplane field with completely built American planes.

**N**ICHOLAS-BEAZLEY'S new production factory is completed, and machinery is being installed. The building has a floor space of 22,500 square feet and will be occupied by progressive assembly stages, metal-working dies, and jigs. Material for one hundred planes has been ordered, and quantity production of the Barling NB3 monoplane will begin soon.

**N**ICHOLAS-BEAZLEY AIRPLANE CO., INC., reports receiving over three hundred applications for distribution rights for their new Barling NB3 monoplane. Although no territory is yet assigned, negotiations have been entered into with several large distributors.

# HELPING TO MAKE AVIATION HISTORY!

## 2 Great Books by 2 Well Known Authorities



Here are two books covering the two most important phases of modern flying, by two well-known and nationally recognized authorities. Each book has been checked by other leading authorities, who recommend them to every man who wants to learn about aircraft engines and navigation. They are books for every flyer and every other man with an itching to get into the air.

## THE AIRCRAFT ENGINE INSTRUCTOR

By A. L. DYKE, A Well Known Authority on Gasoline Engines

Engineers from some of the best known companies assisted Mr. Dyke in the preparation of this great book, which covers modern aircraft engines and miscellaneous accessories and equipment, such as carburetors, magnetos, starters, generators, aerodynamic instruments, etc. Adequate space is devoted to the Wright "Whirlwind," the "Wasp," Curtiss, Packard, Fairchild-Dominex (engine without crankshaft or connecting rods) and other leading engines, including some well known foreign makes. A very complete discussion of the Curtiss OX-5 engine with engine trouble-shooting charts is included. Right up-to-date, including the construction and maintenance of metal (and wood) propellers, principle of operation of superchargers and rotary induction, discussions and illustrations of the "Cyclone," "Hornet," "Chiefain," "Challenger," Warner, Velle, Anzani, etc.

Practical, usable information is given on inspection for worn parts and locating troubles and what to do to correct or repair them.

The Aircraft Engine Instructor is more than a book—it's a complete training on aircraft engine construction, maintenance and operation; an indispensable source of ready information for the mechanic and pilot alike.

Contains 404 pages and over 400 illustrations, many made especially for this book, including large folding colored inserts and master charts. It's the book of the hour. Sent postpaid for \$5.00.

## AIR NAVIGATION AND METEOROLOGY

By CAPT. R. DUNCAN, Licensed Pilot in U. S., Canada, France, England

Here is a book that contains the exact information needed by a flyer to become an efficient air navigator. To study the book and make the widest possible use of it, requires only the ability to read, write and use common sense.

The entire subject is presented in a simple non-technical way without the use of mathematical problems. It explains the meaning of all technical words and terms and deals with maps and charts in a way that the reader cannot fail to understand them. The principles of air navigation, weather forecasting, magnetism and magnetic poles are thoroughly explained before taking up the practical side of flying and the use of flying instruments.

Other sections of the book cover the airplane compass and all instruments used in air navigation, such as the Air Speed Indicator—Altimeter—Course and Drift Indicator—and others.

Complete instructions are given for calculating magnetic variations, deviations, effect of wind on plane in flight (drift), and other problems of air navigation. Night flying, night flying equipment.

Over 243 pages, 70 illustrations. Flexible binding. Sent postpaid for \$3.00.

These are "Willcox" Books—your guarantee of satisfaction. The purchaser of a "Willcox" Book is always satisfied—or he gets his money back.

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# Airplane Industry Presents New Cam Grinding Problem

The popular radial type of airplane motor uses large cams whose several high spots and re-entrant curves of small radii presented a real cam grinding problem. In answer Norton Company has produced a new cam grinding machine—a machine designed to meet the special production requirements of the airplane industry. And behind this new machine is twenty-five years' experience in building Norton cam grinding equipment for the automotive industry.

**NORTON COMPANY**

Worcester, Mass.



# NORTON

Grinding Wheels  
Grinding Machines



Refractories-Floor  
and Stair Tiles



## WICHITA AIR NEWS

**W**ICHITA will hold an aircraft exposition in connection with the opening of the \$75,000 municipal airport this summer, according to sanction granted by the Aeronautical Chamber of Commerce.

### Henderson to Produce Aircraft Engines

**E**XCELSIOR HENDERSON CYCLE CO. of Wichita has announced the development of the standard motorcycle engine into an aircraft power plant developing thirty horsepower at 1,800 revolutions. The motor runs on a dry sump, has the standard tachometer drive, and will cowl into the ordinary fuselage with little head resistance.

**W**ICHITA, realizing the importance of aviation in the future development of a city, has passed a bond issue of \$104,000 for immediate work on an up-to-date airport. The "California" section of the city will be used, and, construction beginning at once, \$20,000 will be spent for lighting the field with three million candlepower lights by May.

The first hangar to be erected will house fifteen planes, and will be 270 by 102 feet. Concrete aprons will be laid in front and about the hangar. The total investment planned for the finished field is \$278,000.

**W**ATKINS Manufacturing Company of Wichita has been appointed the fourth authorized parts dealers for the Wright

Aeronautical Corporation in the United States. The company will carry a complete stock of Wright airplane motor parts and rebuild Wright motors, being distributors for the entire Central West.

The officers of the concern are: E. A. Watkins, president; Charles E. Parr, vice president; and H. B. Riley, secretary-treasurer.

**T**HE University of Kansas at Lawrence, Kansas, is now offering an advanced course in aeronautical engineering to senior students in the Department of Mechanical Engineering, who desire to specialize in this work. At the present time classes in aerodynamics and aircraft design are being given. Other courses will be added later. At present there are fourteen senior engineers and two graduate students enrolled. Professor Earl D. Hay, who has had a number of years experience in teaching aeronautics, is in charge.

## NEBRASKA AIR NEWS

**O**RGANIZATION of Arrow Aircraft and Motors Corporation, of Lincoln, was announced recently to manufacture the Arrow Sport on a production basis. This plane is particularly adapted for training and private uses, being a light biplane with cantilever type wings. It is powered by a sixty horsepower motor.

The Arrow concern is closely allied with the Woods Brothers Corporation, but is

not a subsidiary thereof. It will go into production in the Havelock plant. Plans call for over 300 planes the first year. Mark W. Woods is president of the concern.

The Arrow Sport is becoming steadily more widely known for its excellent performance characteristics, particularly its low landing speed.

## OKLAHOMA AIR NEWS

By C. M. McMILLEN

**O**PENING of airline passenger service between St. Louis, Tulsa, Oklahoma City, Fort Worth and Dallas is tentatively set for March 1, according to Erle P. Halliburton of Duncan, president of the company organized in Oklahoma for operation of the line. Five Wasp tri-motored Ford planes have been purchased by the company for use on the line.

W. G. Skelly, Harry Rogers, Pat Hurley, J. C. Halliburton, Robert Garland, Wate Phillips and E. H. Moore, all of Tulsa, are financially interested in the project.

Later extension of the line westward from Oklahoma City by way of Wichita Falls, Midland and El Paso, Texas, and Tucson, Ariz., to Los Angeles, is planned. Kansas City also is to be made a stop by development of a spur line.

Daily service each way is to be given by the new airline. Planes leaving Dallas and St. Louis will arrive at the other end of

(Continued on next page)

# DU PAGE FLYING ACADEMY

## Offers Superior Flying Instruction



Write  
or  
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New

Biplanes and  
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Courses for  
Private Pilot's License  
Limited Commercial Pilot's License  
Transport Pilot's License

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# TRAIN HERE for the BIG JOBS in AVIATION!



Our pilot-instructors and instructors in aeronautical theory are all men of technical training and long experience in aviation.



Marshall is one of the air centers of the middle west. This picture shows a few of the visitors at the Marshall Flying Field on the occasion of a recent exhibition flight.

## This is not a Trade School

The Marshall "College of the Air" is Conducted on a University Basis to Train Men as Pilots and Aeronautical Executives

AMERICA'S great industry of the future—Aviation—demands more than just trade school graduates. The men who direct the making and selling of planes, the men who pilot ships across the world's skyways must be technically trained. Such training is featured in the new curriculum of the Marshall "College of the Air."

The Marshall Flying School, "The College of the Air," is one of the oldest and most firmly established schools of aviation in America. Only here can you get departmentalized instructions in regular courses based on University Methods. Only here can you get training on all the popular types of new training planes—thorough, practical training balanced by a well-taught theoretical instruction.

The Marshall Flying School is affiliated with the Nicholas-Beazley Airplane Co., Inc., America's foremost supply house and manufacturers of the new Barling NB3 Monoplane. "College of the Air" students are in daily contact with the newest and most scientific developments in the aviation field.

Equip yourself now for a place in America's greatest industry. If you are over 16 and seriously interested in aviation as a profession wire or write us today for interesting information and our free illustrated catalog.

Standard training prices: 10 hours, \$245.00; New production prices: 10 hours, \$298.00; Ground School, 600 hours, \$100.00 (Free with Flying Courses).

At Marshall you learn to fly by flying. Practical instruction is given on the field.

600 hours quality ground instruction free with your flying course. An exclusive feature of this school.

### PLEASE USE THIS COUPON

MARSHALL FLYING SCHOOL, Inc.  
150 North English Street  
Marshall, Missouri  
Gentlemen:

I am interested in aviation as a profession. Will you please send me information on your various courses of training.

Name .....

Address .....



## MARSHALL FLYING SCHOOL, INC.

150 North English Street

Marshall, Missouri



Affiliated with  
NICHOLAS BEAZLEY  
AEROPLANE CO.,  
Incorporated



(Oklahoma Air News continued)  
the line six hours later, according to the schedules prepared.

Excursion trip service also will be a feature of the summer business of the company. Aerial excursions will be operated from cities in Oklahoma to Colorado points and from Texas and Oklahoma to the Gulf Coast.

**TULSA'S** new municipal airport is to have concrete aprons on three sides of the completed hangar for parking planes. A concrete taxi strip will extend to the proposed administration building. These plans are additions to the rapidly developing airport. With the exception of one floodlight, the lighting system is completed. The present hangar has space for twenty planes and three more are to be constructed by spring. The B. Russell Shaw Co. of St. Louis recently completed a building for pilots' quarters.

**JOHN L. HILL**, formerly of Carter Oil Company, Tulsa, has been appointed vice president of Spartan Aircraft Company. **J. F. Lanier**, formerly of Skelly Oil Company, is the new secretary and treasurer of the Spartan organization. **Parker D. Cramer**, famed Rockford to Stockholm navigator and co-pilot, is now a special sales representative for Spartan. **J. Baxter Gardner**, for several years assistant director of public relations for Skelly Oil Company, Tulsa, was recently appointed advertising manager of Spartan Aircraft Company.

**SPARTAN AIRCRAFT COMPANY**, appointing Mr. L. R. Dooley its new sales manager, will completely reorganize its sales force. Mr. Dooley was formerly a district sales manager for the Fairchild Aviation Corporation, and is a graduate of the University of Chicago.

#### Tulsa Notes

By C. W. Short

**THE** management of the Tulsa Municipal Airport has moved into the first of two municipal hangars recently completed. The hangar accommodates 22 planes. The second hangar is to be constructed at once. Hangars are also to be constructed for the Garland Aircraft Corp., and the Spartan Aircraft Company.

Pilot quarters are completed with 10 bedrooms, 2 baths and a large living and reading room.

The lighting equipment on the field is practically complete but is being used by the N. A. T. only at present.

The following companies are operating from the Tulsa Municipal Airport: the Mid-Continent Airways, Inc., having the agency for the Stearman; the Braniff Airlines, operating between Oklahoma City and Tulsa, and Wichita Falls, Fort Worth and Dallas, making 3 round trips per day. Garland Aircraft Corp., operating an air taxi with 3 Ryan Broughms; the Garland-Clevenger School of Aeronautics, with J. H. Dock Dicells as chief instructor.

#### SOUTH DAKOTA NEWS

By J. H. McKEEVER

**AN** international air service carrying express and passengers is tentatively projected to cross South Dakota, with Watertown, S. D., as a junction point with St. Paul and Minneapolis on the route from Winnipeg to Omaha.

**AT** the recent state meeting of Engineers and Architects Association of the state, aviation had a place on the program for the first time. Prof. R. V. Newcomb, of the civil engineering department of the University of South Dakota, spoke in detail of air transportation and airports. His talk was illustrated by slides showing model airport equipment.

**THE** first freight shipment to arrive by air recently arrived in Aberdeen aboard a Curtiss-Robin, piloted by D. K. Baxter. The trip was made from Sioux City. Mr. Baxter covers territory from Fort Dodge, Iowa, to Sheridan, Wyo., for the Frigidaire company and usually flies his Robin.

**CHARLES AAGARD** of Rapid City, an 18-year old boy, is the youngest licensed pilot in South Dakota. He holds a Federal transport license. Three years ago when 15 he began to do odd jobs around the airport in his home town. He got a little pay now and then, but more important, he got free flying lessons until now he has more than 400 hours to his credit.

We're directing this message to every prospective aviation student who intends to "look around" before he decides upon which school to attend.

## Are you "from Missouri?"..... Then let us show you!

Practical Aviation

Elementary and Advanced  
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**F**IRST—let us tell you what we have to offer: The most conveniently located aviation school in America.....right in the heart of New York City. A modern, well ventilated, well lighted building in which we have installed individual rooms for every department. Personnel comprised of experienced, technically trained men, each one an "ace" in his particular branch of the business.

The finest engine room of any school. In it we have every conceivable type of radical air and water-cooled engine, such as the famous "Whirlwind" J5, Siemens-Halske "SH12" 9 cylinder, Anzani 6 cylinder, Velie 5, etc. In short, equipment that is unsurpassed by any aviation school in the United States.

For flying instruction we are using Travel Air's and our own ships—designed, built and flown from our own airport by our own students, under the instruction of experienced Transport Pilots who are ex-army and navy men.

You have read our message—now let us show you. Come in and see for yourself the work our students are doing and what we say is "the truth, the whole truth, and nothing but the truth."

Our president is ready to advise you; will greet you with a welcoming hand.....and best of all the advice will cost you nothing but your time.

If you like our school, register; if you don't, look around some more.....fair enough?

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**RESULTS**—Our graduates have successfully passed the Department of Commerce examinations and are now employed. Our free employment service is always working to help our students find employment in this ever-expanding industry.

## An Important Announcement by

# LINCOLN PAGE

**W**ITH the recent re-incorporation and expansion of the Lincoln Aircraft Company, Incorporated, of Lincoln, Nebraska . . . this second oldest aircraft company in the United States now becomes one of the largest.

Victor H. Roos, an outstanding figure in commercial aeronautics, is our new president. We have an enlarged personnel. New policies have been introduced. Manufacturing facilities are being greatly increased. These factors, combined with a program of vastly increased production, will make this already famous concern one of the outstanding airplane manufacturing establishments in this country.

Plans for 1929 call for the production of 500 Lincoln Page Airplanes, and a new model light training plane. Also new merchandising methods coupled with extensive advertising.

This expansion program will soon show its force in much greater sales for Lincoln Page distributors.

*Dealers:* Investigate the attractive Lincoln Page franchise for your territory.

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Sec'y-Treas.

F. E. BEAUMONT  
H. J. PAUL  
DEE EICHE  
CARL WEIL



## NORTH DAKOTA NEWS

By LLOYD C. TINNES

**C**ONSTRUCTION of a double hangar on the municipal airport at Minot has been started. The Murphy Construction Company has the contract.

E. M. Canfield, who operates a flying school and air taxi, will lease the building and make it his permanent headquarters. Gasoline, oils and a stock of airplane parts will be available.

**A** MAP of the city of Grand Forks showing the location of the city's airport is being drawn by City Engineer E. L. Lium, at the request of the Department of Commerce.

**O.** B. HOLTON, district director of immigration, has received instructions to make inspections of the airports of Grand Forks, Crookston and Minot for the Department of the Interior with a view to locating airports of entry.

**J.** P. HOFSTAD and Al Berglund are now instructing a class of 11 students at the Grand Forks airport.

A good-sized class is in prospect as soon as the weather warms up.

**T**HE Master Aeronautical Corporation, of which George B. Reynolds is president, is continuing to turn out propellers at its factory here and expects good business this year.

**C**LAIR E. CHENEY, pilot of Grand Forks, is instructing a large class of students at Fergus Falls. Mechanic Hopkins, formerly of this city, is engaged in aviation work at Redfield, S. D., this winter.

**A**L BERGLUND, local pilot, is now using John P. Hofstad's Travel Air for student instruction work.

**A**RTICLES of incorporation have been filed by Fergus Falls Air Service, Inc. A passenger airline and airport will be operated by the new concern. Incorporators are Robert C. Anderson, H. W. Kantrude, C. W. Bonde, Orris E. Bergerud, and Philip H. Aune, all of Fergus Falls, Minn.

**A** BILL embodying a full set of regulations for aircraft was recently introduced in the North Dakota Legislature. The bill gives the board of railroad commissioners the power to make such regulations as are necessary including air traffic rules.

The bill requires that every aircraft be licensed in itself and that no person shall fly such craft unless he has a license as a pilot. No fee is set for either the personal or machine license. The measure carries the emergency clause.

**S**TANLEY CADY, Grand Forks air pilot, who has been employed in commercial work for the past year by the Northern Air Lines, Minneapolis, Minn., has been transferred to Mexico by his concern for similar work in that country.

## MINNESOTA AIR NEWS

By W. S. SCHLEY, JR.

**T**HE Central Air Lines, a division of the Air Service, Inc., has branched into the transportation field and has established its first line between Wichita and Tulsa. The line will later extend to St. Paul.

Mr. E. A. Watkins is president of the new organization. Other officers of the line are John Turner, vice president of the Travel Air Company, vice president; Norman Warningske, former president and now general manager of Air Service, Inc., secretary; Charles Parr, general manager of the Coleman Lamp Company of Wichita, treasurer.

**S**PECIAL aviation strip maps covering air mail routes from the Twin Cities to Chicago through Milwaukee are almost completed by the Department of Commerce.

**W**HEN every other airplane line operating out of Chicago was halted recently by the weather, all ships of Northwest Airways came through on time without trouble, it was reported.

**A** NEW formula for the dope used in coating airplane wing fabric, developed by G. Schubert Knapp of St. Paul, is claimed to be virtually non-inflammable. Fabric treated with the new formula was unharmed when soaked in gasoline and set afire in recent tests and resisted the flame of a blow torch.

(Continued on next page)

## THE CHOICE of AMERICA'S LEADING AIR TRANSPORT COMPANIES

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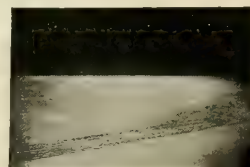
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**"THE NEW STANDARD IS THE TRUE STANDARD"**



(Minnesota Air News continued)

A NEW air mail insignia, designed by Colonel L. H. Brittin, vice president and general manager of Northwest Airways, Inc., of Twin Cities, has been adopted by postal authorities as the official insignia of the United States air mail service.

Only pilots engaged in the regular and continuous carrying of United States air mail on contract lines will be allowed to wear the insignia.

TWO of the fleet of 10 new trimotored Fokker planes for Universal Airlines have been received. They are equipped with kitchenette and have steward service. The ships will replace present equipment on trunk lines.

GEORGE B. SCHIERBERG, secretary and treasurer of the Robertson Aircraft Corporation, has been named treasurer of the Universal Aviation Corporation, of which the Robertson firm is a subsidiary.

THE distinction of being the first stow-away on the airline from the Twin Cities to Chicago goes to Tony Gilde of St. Paul. Tony managed to hide himself in the baggage compartment of the Universal Airlines Fokker plane before it took off from the Wold-Chamberlain field. On arrival at Chicago, he was arrested but later he was brought back to St. Paul where he received a movie contract from the New York office of the Metro-Goldwyn-Mayer corporation. William McNeil was piloting the plane.

## DULUTH AIR NEWS

By ARTHUR G. PATTERSON.

ESTABLISHMENT of a municipal airport in Duluth is now to be a reality due to the passing of a resolution by the city council calling for the purchase of the 640-acre site from St. Louis County. A sum of \$150,000 has been set aside by the city council for development of the airport site, and the county has also given Duluth aid to the extent of \$20,000, making \$170,000 available. Plans for the development of the field have already been started by the city engineering department and will be submitted to the Federal government for approval before actual construction work is started.

MORE than 150 people attended the first aviation banquet held in Duluth at the Spalding Hotel and sponsored by the Duluth Exchange Club. Those who spoke are: Lieut. Mark W. Hurd, pilot for the Universal Airlines Company of Minneapolis; Lieut. Roger J. Sergeant, chief pilot of the Duluth Flying School, and Lieut. Julius M. Nolte, instructor of aviation in the Minnesota University extension course. A model airplane built by C. A. Lindberg of Duluth was exhibited at the dinner.

IN a recent address before the Lion's Club, Lieut. Earle D. McKay, United States Naval Reserve officer, urged construction of an airport along Duluth's waterfront, stating that it was suitable for use as a base for U. S. Naval air activities.

LIEUT. R. J. SERGEANT, chief pilot of the Duluth Flying School, performed stunts in the air over Duluth in an Eaglerock as a special feature of the Alexander Eaglerock national aeronautical scholarship contest.

### Northern Minnesota Notes

By Arthur G. Patterson.

THE Brainerd airport, owned by Rosko Brothers of Brainerd, contains 160 acres. Two runways have been completed, one east to west 1,950 feet long, and the other north and south 1,330 feet in length. A third one is to be built running northeast and is to be 2,200 feet in length. All runways are 350 feet in width.

THE Virginia Board of Education is making plans for offering an aviation course in the public schools of that city. Application has been made to the War Department for two engines and a fully equipped airplane. Only instruction in ground work will be taught.

WILLIAM J. CENTNER, of the Department of Commerce, was in Eveleth recently where he inspected several sites for Eveleth's proposed airport.

The Eveleth Chamber of Commerce has appointed the following men to serve on the airport committee: A. Johnson (chairman); K. C. Barrows, L. J. Eckenrode, J. H. Helps, F. Myers, V. Park and G. Wills.

(Continued on next page)

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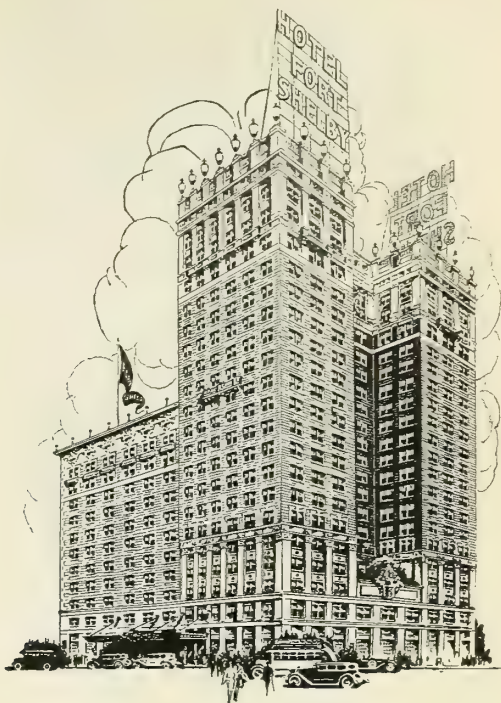
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excellent rooms at \$3, \$3.50, or \$4, or one of the higher-priced, especially large rooms or suites overlooking the city, or the river and Canadian shore, you will enjoy a particular sense of value in the Fort Shelby. Guests arriving by motor are relieved of the care of their cars by competent attendants.

*Tickets to theaters, concerts, operas, sporting events, etc., reserved in advance upon request at the Fort Shelby.*



(Northern Minnesota Notes continued)

THE American Legion post at Ely has appointed an airport committee to study the airport problem in Ely.

THE Fort William, Ontario, aero club has secured an airport site next to the municipal golf course containing 100 acres. Two Moth planes will be used by the thirteen members of the club.

## WISCONSIN AIR NEWS

By WILLIAM SCOLLARD

UNDER a complete plan for the development of the north half of the county airport near Milwaukee, approved by the county park commission, six runways are to be provided. Two will extend north and south, and east and west, forming a square with two diagonal runways connecting the four corners. The average length of the runways is to be 3,000 feet.

Hard surfaced runways are now under consideration by the committee. Purchase of a new, first-class rotating beacon light on a 75-foot tower was approved. A building for an electrically operated oil filling station, 30 x 44 feet, was also approved.

ESTABLISHING a new airline from Milwaukee across Lake Michigan to Detroit is now considered certain. The Northwest Airways, Inc., and the Milwaukee Association of Commerce air service committee have been conducting a campaign to have the Department of Commerce approve this route so it may be opened this year.

THE Alonzo Cudworth Post of the American Legion, in conjunction with the Milwaukee County Park Commission, is planning an air meet to be held this summer in connection with the dedication of the county airport.

STARTING of a second Wisconsin air mail line was recommended by John P. Wood, Wausau, during a meeting of the Milwaukee Association of Commerce air service committee recently. It was declared that Wausau, Appleton, Stevens Point, Sheboygan, Manitowoc, Wisconsin Rapids, Kohler and other state cities were anxious to support air mail service.

FOLLOWING the recent merger of the Hamilton Metalplane Co., and the Hamilton Aero Manufacturing Co., Milwaukee, with the United Aircraft & Transport Co., announcement has been made that the Milwaukee units will be maintained as subsidiary units with Thomas F. Hamilton, president of the two Milwaukee companies, in charge.

Immediate increase in production in the propeller plant to double its capacity will be started. This will mean the addition of 100 men to the force to make a total of 250 and the spending of \$60,000 to \$70,000 for additional machinery.

ORGANIZATION of the Invincible Aircraft Corporation to manufacture the Invincible planes, designed in Manitowoc, Wisc., with plans for the erection of a three-

story factory plant in Manitowoc, was approved at the annual meeting of the Manitowoc Metal Furniture Company recently.

This announcement was made coincident with the official test flight, February 5, of the first plane manufactured by the company, the Invincible. The plane is a cabin monoplane driven by a LeBlond 90, seven-cylinder radial motor.

ALL officers and directors of the Tri-City Airways, Inc., Wisconsin Rapids, Wisc., were re-elected as follows: John E. Alexander, president; Isaac P. Witter, vice-president; G. D. Fritzsinger, secretary-treasurer; E. P. Gleason, engineer. These men, together with Charles E. Briere, L. P. Daniels and G. O. Babcock, form the board of directors.

THE Brown County Park Commission has secured an option on an airport, now called the Brown County Airport, Inc., which gives the county the privilege of using it on a rental basis for a period of time, with a right to purchase it later.

ARTICLES of incorporation were recently filed by the Wisconsin Air Lines, Inc., at Kenosha, for the purpose of dealing in and operating airplanes. Incorporators are Lieut. Hart G. Smith, Floyd D. Bayless, and E. M. Smith.

BERNARD F. MAGRUDER was recently elected president of the Racine Flying Club. Other officers elected include Charles W. Reynolds, vice-president; and Sherman Blandin, secretary-treasurer. These officers were elected by a new board of directors consisting of Frank Lovell, Mr. Magruder, C. W. Reynolds, Sherman Blandin, and Ed. Hedeen.

JOHNNY WOOD, winner of the National Air Tour and president of Northern Airways, Inc., acted as King of the Wausau Winter Frolic, the annual winter carnival of Wausau, Wisconsin.

GOVERNOR WALTER KOHLER recently appointed John P. Wood, winner of the National Air Tour and president of Northern Airways, Inc., one of his aide-de-camps with the office of Major. Lester J. Maitland of Milwaukee received a similar appointment.

THE Glider Club of Wisconsin has been organized at Milwaukee for the purpose of building and operating gliders. The club plans to maintain a workshop and hold regular meetings.

The founders are J. P. Shroeter, Arthur Baumann, Clarence Berg, and Paul Shroeter, Jr.

BURLINGTON, Vermont, recently purchased a new Esline all steel hangar, eighty by sixty feet. The sale was made by the Vermont Airways Corporation, distributors for the Esline Company of Milwaukee.

## SUPERIOR AIR NEWS

By ARTHUR G. PATTERSON.

THE municipal hangar, to be constructed by the city of Superior at the municipal airport at Billings Park at a cost of \$50,000, will house the training school headquarters, machine shops, rest rooms and offices of the Head of the Lakes Airways. The school course will cover a twenty-week period. B. A. Wright, of Chicago, will be in charge of the instruction department.

RICE LAKE, located about one hundred miles south of Superior, has under consideration the purchase of a 160-acre tract for use as an airport. The municipal airport would have runways 2,000 feet long in every direction and would be equipped with beacons.

THE Superior Vocational Evening School, operated by the Board of Education of Superior, has added an aviation course to its list of subjects taught.

## IOWA AIR NEWS

By R. W. MOORHEAD

REPRESENTATIVE LETTS recently received official word from the Department of Commerce at Washington, advising details of plans regarding the proposed change in the Omaha-Chicago airway between Des Moines and Tipton. The report of the shifting of the present stop from Iowa City is denied.

In addition to pointing out that the Department has no authority to designate air mail points, it was said in the Washington statement, "It was not the intention of this bureau to undertake the reconstruction of the airway from Iowa City to Des Moines this fiscal year because of expense involved therein, but some consideration has been given to the routing of this airway via Colfax, Newton, Grinnell and Marengo, thence deviating southerly to Iowa City for the night schedule and northerly into Cedar Rapids for the day schedule."

This has been the source of much misunderstanding here.

GEORGE YATES was re-elected president of the Des Moines Aeronautical Association at the annual meeting held in that city recently.

Other officers are: J. M. Walton, vice-president; Jack Keating, secretary-treasurer; James W. Christenson, Edmund H. Martin, Edward O'Dea, J. E. Tone, W. W. Waymack and Burd S. White, directors.

C. C. CASWELL, advertising manager of the *Cherokee Times*, has taken the position of advertising manager for the Brailey School of Flying at Wichita, Kans.

THE chamber of commerce of Newton has signed a lease on a farm east of the city for an airport. The lease is to run ten years beginning in March. The lease has the approval of Harry Larson, aeronautical engineer of the airways division of the Department of Commerce.

(Continued on next page)

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In a Clayton & Lambert you buy all the exactness and pride that can be put into a blow-torch. You get materials that have proved their value by use. You obtain the result of 40 years' experiment and invention—exclusive Clayton & Lambert improvements. In construction and mechanism, Clayton & Lamberts are made with an eye for long, efficient service.

For instance—the vaporizing chamber has an exclusive vein system for quicker, hotter heat. That makes the torch function better and saves money on your fuel bills. All fittings are built into the tank by a patented method that prevents their falling in or coming out. There's *absolutely no danger* of an explosion with a Clayton & Lambert torch. Even the most delicate part—the gas orifice—is foolproof. In the No. 158 the orifice has a guard. The slightly higher priced No. 32 has a patented design so that you'll never ruin the torch by a careless twist of your wrist.

The next time you're in a hardware or electrical store look for a torch with a gold-banded, red handle. Be sure of the handle—it marks a Clayton & Lambert. Then you're getting the largest selling torch in the world.

**CLAYTON & LAMBERT**  
MANUFACTURING COMPANY  
DETROIT, MICHIGAN



*(Iowa Air News continued)*

The Government will light the field and begin construction as soon as weather permits. The Newton Chamber of Commerce will erect hangars and all other equipment not constructed by the Government.

**S**IOUX CITY is having trouble in deciding on the location of its municipal airport. Three good fields are available. They are the Rickenbacker Field in South Dakota; a field near South Sioux City, Nebraska, and a field south of Sioux City near the city limits.

**C**ARROLL, IOWA, may be selected as the site of an aircraft company to be capitalized at \$125,000 and sponsored by W. I. Saul. A proposition has been submitted to the Carroll Commercial Club, with the object of raising capital to insure location of the factory there.

Saul, together with L. R. Chapman and R. W. Humphrey, recently returned from a conference with Glenn C. Boyer, construction engineer for the American Eagle Air-

craft Company, Kansas City, and reported that Boyer has agreed to superintend construction for the Saul corporation.

C. L. Offenstien, Washington, D. C., chief engineer of the aeronautics branch, Department of Commerce, has been retained to design the airplane proposed for manufacture. It is to be a four-passenger cabin monoplane with three sixty horsepower radial motors.

**T**HE Yellow Cab Airways, Inc., has taken possession of the hangar at the Des Moines municipal airport, following final adoption by the city council of the contract calling for a two-year lease.

The company is granted exclusive right to sell gasoline, oils, repairs, planes and service.

Russell Reel, who is president, has announced that the company will have ten or fifteen planes when its school opens.

**A** WELL rounded code of aeronautical law may be expected from the present session of the legislature. Chief among laws to be discussed will be a measure to permit cities and towns to obligate themselves by bond or otherwise, in acquiring landing field space. Most cities which now have municipal fields have found it necessary to purchase them from park funds. Regulatory measures will also be presented.

**A** GROUP of aviation enthusiasts at Cherokee has formed the Cherokee Flyers, with membership in the club limited to fifty.

The officers elected are: R. G. Rodman, president; W. H. Wiese, Meriden, vice president; E. D. Huxford, treasurer; and George Mantor, secretary.

**T**HE Tri-State Airlines has been purchased by Hanford's, Inc., of Sioux City. James Barwick, veteran chief pilot of the Tri-State Airlines, will continue in the same capacity for the new company. Future plans include operation of a school of instruction and a passenger and sightseeing service.

**P**OSSIBILITIES of a new air mail route which would extend directly from the Twin Cities to Kansas City via Des Moines have been reopened with the Post Office Department.

Should the new route through Des Moines be adopted it would give the city and state of Iowa its third air mail service.

The additional airline would make a difference of one day in delivery of Iowa and Minnesota air mail to western and southern points. At the present time air mail for either west or south has to go to Chicago to catch westbound and southbound planes. With the short line established, this mail could leave Minneapolis at 7:00 p. m. and be brought direct to Des Moines to catch the westbound plane at 10:40 p. m. and reach Kansas City at 1:10 a. m.

**T**WO Iowa universities—Drake, in Des Moines, and the University of Iowa at Iowa City—are offering courses in aviation at the start of their second semester's work.

In each case the course deals with the theory and mechanics of aviation rather than actual flying.

Two airplane engines and old planes with which to demonstrate technical instruments have been provided in the equipment secured by the University of Iowa. Prof. F. P. Scone will direct all aviation courses at Iowa City.

**SKY WORDS**

**"SKY WORDS"**—a glossary of aeronautical terms" is the title of a booklet recently issued by the Vacuum Oil Company of New York. Taking up the technical phrases which the layman hears, it defines and explains them, along with aerial stunts. In the slang section it lists the catch expressions of aviation.


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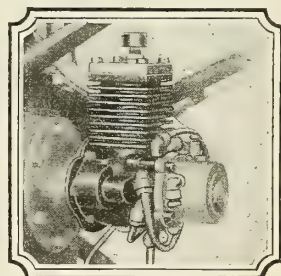
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## AIRPLANE TRANSPORTATION

By  
James G. Woolley and Earl W. Hill

TWO chapters of the book were written by William P. MacCracken, Jr., Assistant Secretary of Commerce for Aeronautics, and another chapter by Dr. Carl Gustaf Russby, who is Chairman of the Committee on Aeronautical Meteorology for the Guggenheim Fund.

The book is aimed for general reading and as an elementary text in high schools, colleges and universities. It discusses aviation from a transportation viewpoint only, converting terminology from the scientific to language which the layman will readily comprehend.

The subject matter is divided into twenty chapters and takes up the effect of transportation on civilization, history of airplane transportation, theory of flight, commercial application of the airplane, types of airplanes and types of motors, insurance, meteorology, regulations, rates and rate making, the general theory as well as the application, air commerce costs and operation; mail, express and passenger services, investment and speculation.

The book is intended to give a comprehensive understanding of the airplane in commerce to anyone who is interested, and also lay the groundwork for the further, more detailed study of the economics of airplane transportation.

The subject matter of the book was compiled over a period of fourteen months during which the University of Southern California gave a course in airplane construction under the instruction of Professor Earl W. Hill. The lectures from which the information was given were contributed by leaders in the industry from over the entire nation.

## PATENTS—LAW AND PRACTICE

By Oscar A. Geier.

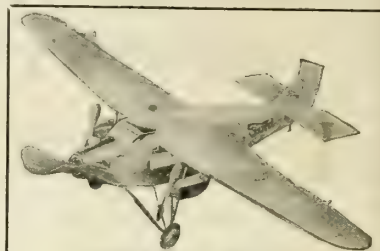
DUE to the changes made in patent processes and laws since the publication of the last edition of "Patents—Law and Practice" in 1924, Oscar A. Geier has been compelled to revise completely the work in this edition. In doing this, he has given the latest laws and practices and made them available for the layman by simple explanations and the use of bold face type at important points.

Taking up the procedure in regard to patents, patent-rights, and infringements, the author gives a simple digest of the law. He defines what may be patented and to whom, followed by an explanation of the procedure in the patent office. Interferences between patents and patent-seekers is explained and solutions shown, with a discussion of appeals. Ownership rights, trademarks, copyright, foreign patents, and charges of foreign patents complete the subject matter of the book and are given with the author's usual simplicity and directness.

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**Nicholas-Beazley**  
**Airplane Company Inc.**  
*Marshall - Missouri*





# FOREIGN NEWS IN BRIEF

Compiled from reports from AERO DIGEST'S correspondents, the Automotive Division and the Transportation Division, Bureau of Foreign and Domestic Commerce

## FRANCE

### Notes from France

By Paul E. Lamarche, Jr.

ACCORDING to *Les Ailes*, a French weekly aeronautical paper, there were orders for approximately 5,200 new aircraft unfilled in the middle of last October. During 1929 the French expect to construct 10,000 new planes and as many as 15,000 by 1930. It is well known that the French aeronautical industry is engaged in the construction of planes for many foreign countries, especially those for military purposes. According to reliable information, there are in France at present 2,000 military planes and 250 commercial planes. Of the 250 commercial planes in use, 110 are said to be between eight and ten years old, 56 between seven and eight years old, 50 between three and six years old, and 42 between one and three years. Many of the older planes are to be replaced by more modern flying stock on the French airlines as soon as they can be built.

THE French are constructing for the Schneider Cup Races two Nieuport-Delage and two Bernard seaplanes which will be powered by 1,200 Hispano-Suiza and special Rhone-Gnome-Jupiter motors. The two Bernard planes are rapidly nearing completion, and will probably be ready for trials by the end of March. Four pilots have already been selected, Sadi Lecoq, Lasne, Demougeot and Bonnet. Lecoq is one of France's foremost aviators and has in the past held world records for both altitude and speed. Lasne is a civil pilot of wide experience. Demougeot is known to Americans as the pilot of the flying boat that was catapulted from the French liner *Ile de France* on several trips during last summer. Bonnet is an army flier and once held the world speed record which at that time was 268 miles an hour.

P. E. FLANDIN, vice president of the French Chamber of Deputies, who came to America for the International Civil Aeronautics Conference in Washington, has asked America to take the initiative in calling an international meteorological conference for the purpose of studying the weather conditions of the oceans for the benefit of aviators.

## SOUTH AMERICA

SCADTA AIRWAY SYSTEM has recently added a regular hydroairplane service between Barranquilla and Guayaquil. This route has headquarters in Barranquilla. The plane leaves every Saturday for Cartagena, Buenaventura and Guayaquil, arriving at its destination Sunday afternoon and starting the return trip the following

Wednesday. Daily flights are made to the interior of Colombia. Facilities are offered for air mail, parcel post, and passengers. Later, air connection will be made with the Peruvian Airway System at Payta, Peru.

### Argentina Transatlantic Flight

LIEUTENANT Claudio Mejia and Diego Arzeno, of Argentina, recently purchased the Ballanca sesquiplane *Roma*, in which they will undertake in March a non-stop transatlantic flight from Buenos Aires to Seville, Spain. The *Roma* was built last year by the Bellanca Aircraft Corporation at New Castle, Delaware, for a non-stop flight from New York to Rome by Caesar Bonelli and Roger S. Williams.

After the installation of a Wright Cyclone motor of 525 horsepower, the ship will be flown to Buenos Aires.

Lieutenant Mejia, who has won a wide reputation as a pilot, and Senor Arzeno, a wealthy young Argentine who will accompany him as navigator, represent a group of Argentine aviation enthusiasts who have raised a fund for the flight, which will be in connection with the Spanish American Exposition at Seville.

The Argentines plan to take off about the middle of March. The route over the Atlantic will be 3,170 miles.



Diego Arzeno and Claudio Mejia

A NEW mail route to Santiago, Chile, is planned by the Post Office Department. The new route, down the west coast from Cristobal, Canal Zone, to Santiago, will be another link in the chain of air mail service to Latin America, and about the Caribbean Sea. The new route will also be a part of the Department's proposed air service to Buenos Aires. Bids for the mail contract have been received.

THE air mail fee for parcels carried by the Scadta Airways to any city in Columbia has been reduced to one dollar per pound. The rate to any city in Ecuador is \$1.50 per pound. The minimum weight for each parcel has been reduced from 2.2 pounds to one pound.

## SWEDEN

### News of the Swedish Air Service

By Dr. Carl Hanns Pollog

THE year 1928 was the fifth year of service of the only Swedish transport aviation company, the Aktiebolaget Aerotransport, Stockholm. The company operates two services only: Stockholm, Sweden, to Helsingfors, Finland, with an intermediate landing at Abo, Finland; and Malmö, Sweden, to Copenhagen, Hamburg and Amsterdam. The first route, which crosses the Baltic Sea, is operated with seaplanes. A third service, Malmö to Copenhagen, Lübeck and Berlin, was taken over three years ago by the Deutsche Luft-Hansa. With these few services the absolute transport figures cannot be very large—53,928 passengers, 682,000 pounds of baggage, mail, express and freight carried and 937,027 miles flown during the 5 years. But the Aktiebolaget Aerotransport can boast a record which would scarcely be possible with any terrestrial means of transport: during their 5 years of service, not a single passenger has ever been injured.

The Aktiebolaget Aerotransport is using Junkers planes, of which it possesses 4 single-engined and 4 three-engined. One of the latter is the *Upland* which has become famous in connection with the Nobile relief expeditions.

## ENGLAND

THE Armstrong Siddeley Motors, Ltd., of London, is forwarding public education in aeronautics by the publication of the Armstrong Siddeley "Air Mail." Published in English, French, Spanish, and German, the publication has an unlimited field.

This publication includes data on noteworthy performances of airplanes in all parts of the earth, descriptions and explanations of processes in the building of airplanes and announcements of new inventions and new experiments in the field of aviation.

In all these points "Air Mail" serves a double purpose: to interest and to inform.

TWO achievements of a Junkers W. 34 plane powered by a Bristol Jupiter series VII engine have been approved by the Federation Aeronautique Internationale as world's records: With a useful load of 1,102 pounds the height of 30,151 feet was reached; with a useful load of 2,204 pounds, a height of 25,941 was recorded.

A NEW engine for airships, known as the Beardmore Tornado, has been developed in England, which burns crude oil, costing \$25 a ton, instead of inflammable petrol. The motor weighs only eight pounds per horsepower and the new fuel considerably reduces the fire risk on airships.

(Continued on next page)

# SCINTILLA

Aircraft Magnetos



## Coast-to-Coast Record Shattered Again



Capt. F. M. Hawks' Lockheed Vega Monoplane was powered with Pratt & Whitney Wasp on which Scintilla Aircraft Magnetos are standard equipment.

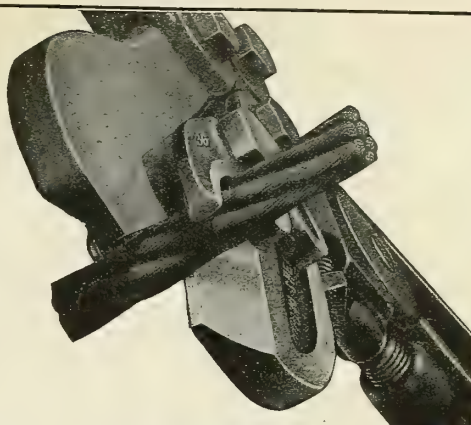
Dependability makes such record flights possible. Scintilla Aircraft Magnetos are known for this characteristic.



The type of Scintilla Aircraft Magneto with which the Wasp Engine of the "Air Express" is equipped.

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Jaws cut like shears, leaving no broken edges or no uncut strands. Will not unduly twist or distort material. Makes clean cut at one operation.

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flat stock  $1\frac{1}{4}$ " x  $7/32$ "; 36 inches long to cut  $5/8$ " wire rope or  $1\frac{1}{2}$ " x  $9/32$ " flat stock.

These, and all other Portertools, are sold by leading jobbers and supply houses.

The Porter line includes Bolt Clippers, Nut Splitters, Shear Cutters, Wire Cutters, Chain Cutters, etc.

Send for illustrated booklet describing tools and their uses.





(Continued from preceding page)

**G**LOSTER AIRCRAFT COMPANY and Messrs. H. H. Martyn and Co., Ltd., recently gave prizes to students of architecture amounting to £150 for designs of airdromes. Of the nine designs received in the final competition, Mr. D. H. McMorran and Mr. H. Hartland shared the first prize of £125, and Mr. L. G. S. Farmer received the second prize of £25. The models were displayed at the Royal Institute of British Architects.

### Imperial Airways' London to India Route

**J**OINING England to one of her distant possessions by air for the first time, the Imperial Airways will inaugurate on March 30 their London to India route. The weekly service planned will carry freight, passengers, and mail, and will bring India within six days, five and three-quarters hours of London.

The journey will be made by a combination of land planes, trains, and flying boats. The first hop from London to Basle will be flown by big triple-engined aircraft. At Basle a transfer will be made to the night sleeping car express for Genoa. A fleet of new all-metal flying boats built for this service will operate between Genoa and Egypt. The flight across the Arabian Desert to Baghdad, Basra, and down the Persian Gulf to India, will be made in triple-engined planes which have been operating the Cairo-Baghdad-Basra airline with much regularity for the past two years.

The weekly service will leave London each Saturday morning and arrive at Karachi, India, the following Friday; the return passage will leave Karachi every Monday and will arrive in London the following Sunday.

**O**WING to various improvements, the three new Armstrong Siddeley Argosy Airliners now being built for Imperial Airways, Limited, will have a cruising speed of nearly one hundred miles per hour, and a radius of action of five hundred miles. The new features of these liners include servo lateral control, anti-stall automatic slots, more powerful Jaguar engines of the geared type, and improved exhausts.

An improved arrangement of the exhaust will reduce the noise of the engine.

## GERMANY

### Notes from Germany

By Dr. Carl Hanns Pollog

**T**HE Deutsche Luft-Hansa has issued preliminary statistics for 1928 which are given below:

Passengers .....	111,000
Baggage carried .....	1,918,000 pounds
Freight and express carried .....	2,271,000 pounds
Mail and newspapers carried .....	1,069,000 pounds
Distance flown .....	6,301,000 miles

Specially interesting is the fact that the amount of freight and express carried increased about 60 per cent over 1927. Certainly the inauguration of the air-mail service for freight (Flei-Verkehr) late in 1927 has brought about this result.

**A**T the instigation of the Deutsche Luft-Hansa, representatives of the more important European transport aviation companies recently met in Berlin to discuss the international summer time tables. The following countries were represented: Austria, Belgium, Czechoslovakia, Denmark, France, Germany, Great Britain, Holland, Russia, Sweden, Switzerland.

**T**HE Raab-Katzenstein factory, where light planes are constructed, is reported to be building a new type of small dirigible airship.

### Giant Airplanes in Germany

**I**N Germany at least three projects of giant ships are being earnestly discussed, and two of them are to be realized this summer. The construction of the third and largest plane will take some years still. Since the constructors are working under strict secrecy, not much authentic material has been issued up till now. That which is available is compiled in the following lines.

The Junkers J.38, which is being built in the Junkers plant at Dessau, will presumably be completed first. It will be an all-metal plane with corrugated duralumin covering. The length overall of this plane will be 76 feet, the span 148 feet. If—as is probable—the Deutsche Luft-Hansa buys a J.38, it will have a cabin equipment for 35 passengers. It will be powered with 4 Junkers \*L.55 engines with a max-

imum output of \*650 horsepower each.

The wing will be partly used for accommodating the passengers, and by means of a roomy gangway the engines will be easily accessible during the flight.

Another giant ship, a flying boat, is being built by the Dornier works, Friedrichshafen, in the plant on the Swiss side of Lake of Constance at Altenrhein. It has been reported that it will be able to carry 100 passengers. It will be completed by summer or autumn, and the cost of construction has been rumored to be ¾-million dollars.

The largest airplane is planned by Dr. Rumpler. The span of this flying giant will be 289 feet, and the maximum thickness of the wing 9 feet. It will be a hydro-airplane with two floats. Ten pusher screws driven by engines of 1,000 horsepower each will give the machine a speed of 155-185 miles per hour.

**O**N the occasion of his seventieth birthday, Dr. Hugo Junkers received numerous honorary degrees from European universities. Munich Polytechnic Institute gave him the degree of doctor of engineering, Giessen University conferred upon him the honorary degree of doctor of philosophy, and Coethen Commercial College awarded him the degree of senator. The Prussian Academy of Sciences honored Prof. Junkers with a corresponding membership.

### BAYERISCHE FLUGZEWERKE

**A. G.**, of Augsburg, has designed a new two-seated monoplane for sport and school purposes. It is the M-23, having the wings fitted to the lower edge of the fuselage without struts, so that they can be folded back. It is of plywood construction throughout.

**M**ONOPLANE G. M. G. II is a new type of light two-seater sport plane put on the European market by Februeder Mueller Flugzeugbau of Griesheim bei Darmstadt. Powered by a thirty-five horsepower Auzani engine, the plane is of wood construction throughout. The wings are mounted on a fixed bridge over the cockpit, and are supported by one strut on each side to the lower edge of the fuselage. This plane has a cruising speed of eighty-one miles per hour.

## MEXICO

### A. F. I. Air Races at Mexico City

**T**HE 1929 Aeronautical Exposition and International Air Races, under the auspices of the International Federation of Aeronautics, will be held May 15-31 at the Civil Aviation Field, Mexico City.

Besides the Mexican National Races at Mexico City and those to be flown to Central America, five big races from points in the United States will terminate in Mexico City.

Six days, May 16, 17 and 21, 22, 23 and 24 will be devoted to the Mexican National Races.



The Heinkel H.D.22 used by Major George Reinburg, air attaché at Berlin.



Maddux Air Liner—  
16-passenger Ford,  
tri-motor plane.

## Double *Pyrene* Protection for Maddux Air Liners

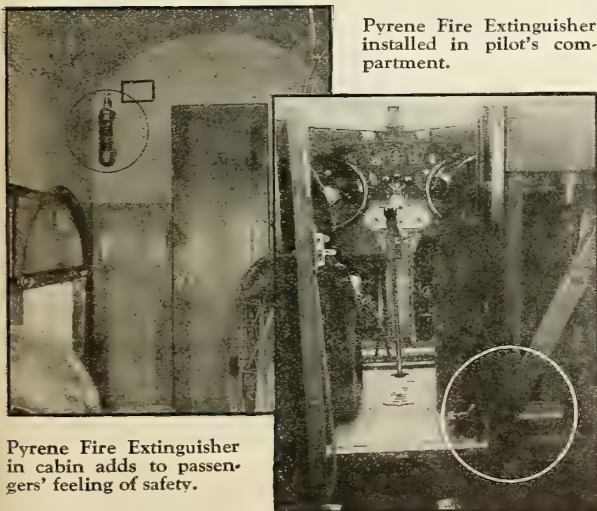
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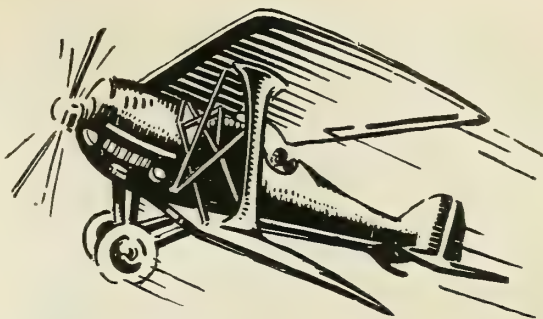
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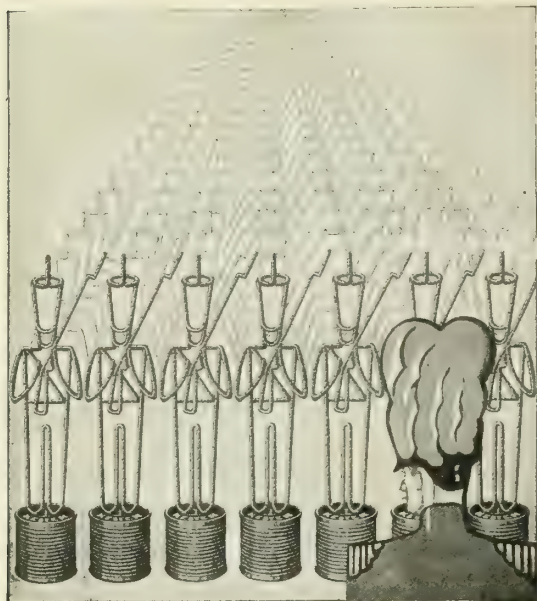
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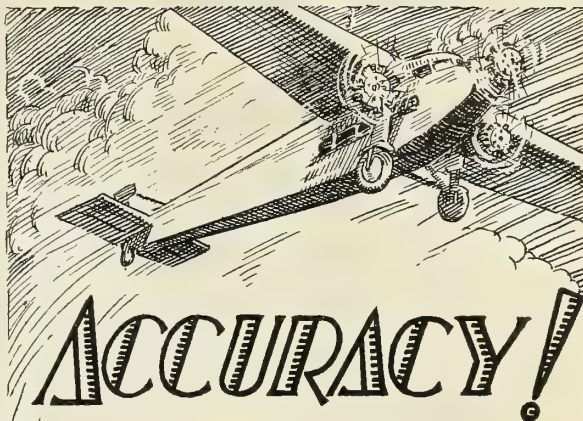
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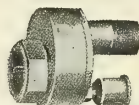
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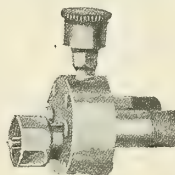
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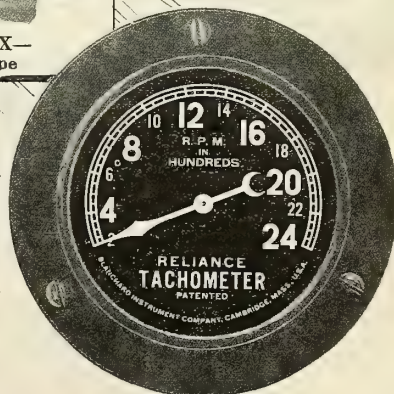
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## INSURANCE AND AVIATION

(Continued from page 82)

determined, and, while the loss of a \$30,000 airplane might be of some consequence, it would probably not be serious to a well-financed aviation company.

Let us now take up the passenger hazard and assume that a plane flying from Boston to Los Angeles is carrying ten passengers and that in a crash all are killed. If the crash occurs in Massachusetts or Connecticut, the liability would be limited by law to \$10,000 per passenger or \$100,000 for all. If in New York there is no limit and a \$50,000 verdict on the part of a jury for each passenger would not be excessive, making a possible total liability of \$500,000 on one machine. If the crash occurred in New Jersey, Pennsylvania or Ohio, there is no limit in law as to the amount of liability for each death. However, the verdicts possibly would be lower than those in and around New York City.

If they crash in Indiana, Illinois, Missouri or Kansas, the limit of liability is \$10,000 per person. In Colorado the limit is \$5,000 per person or \$50,000 for the ten. Here we find a possible difference between the crash in Colorado and the crash in New York of \$450,000. New Mexico, Arizona and California, again, are unlimited. If, on the other hand, the plane became lost in fog and crashed just beyond the Mexican border, there would be absolutely no liability even if the whole ten passengers were killed.

It, therefore, can be seen that insurance companies must not only endeavor to foresee the number of people to be killed per a million flying miles, but they must endeavor to foresee *where* they will be killed, if they are to even approximate this cost.

A still greater scope for large loss exists as respects those on the ground. If a plane crashed into a building housing other human beings, not only will there be liability for the destruction of the building but liability for the destruction of those lives. Here again, as between a plane crashing on a church or theatre in and around New York City or somewhere in Colorado, there might be the difference between \$5,000 and \$50,000 for every person killed.

There is yet another problem that must be solved by insurance companies. No well regulated insurance company can afford to have more than a certain amount at risk on one contingency. If a conservative, well-managed American company concluded to have at risk as much as \$25,000 on one airplane and the aviation transportation industry is going to require \$500,000 or more insurance on one plane, it means that the writing company must reinsure or give over to other insurance companies nearly a half a million dollars of the risk. That presupposes the writing company obtaining the privilege of obligating other financial institutions to the extent of twenty times the amount it is willing to obligate itself.

And, secondly, in the placing of this surplus insurance, the writing company needs to be not only a banker but a super-banker. It must not only be sure that the company with whom it reinsures is financially responsible at the present moment, but that it will be financially responsible five, ten, or perhaps thirty years hence.

The enumeration of these difficulties is not intended to be discouraging. They must be and they *shall* be worked out promptly by the actuaries, statisticians and underwriters of the insurance companies.

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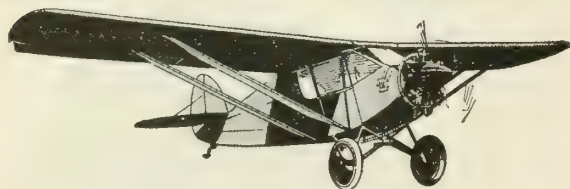
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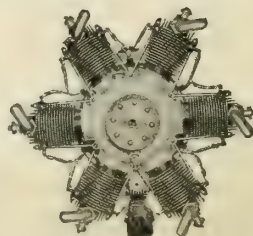
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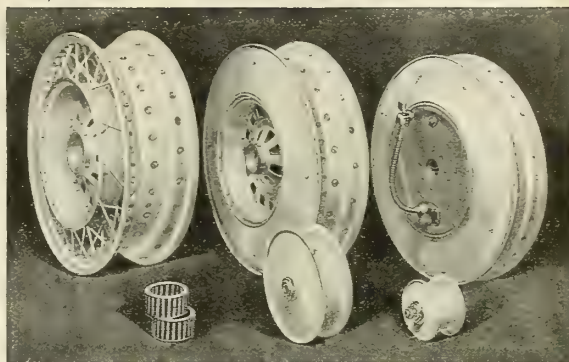
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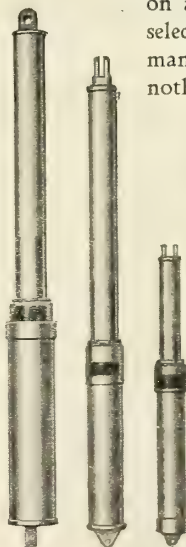
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## BLAZING A TRAIL

(Continued from page 84)

hanging over the airport extended through the valley west of the mountains and forced us to climb our machines to fifteen thousand feet directly over the base before setting an eastward course. From that position, we could see the challenging snow-covered peaks sixty miles away, and we headed for them above the haze that hid all checking points below.

We crossed the first range at twenty-one thousand feet over a place called Ticlio, northeast of Lima where the mountains run in parallel trails further to assure all men that no one shall cross the mighty Andes. Over the valley between the ranges, we became separated. Inasmuch as it was Alvarino's first cross-country flight, I felt some apprehension over his disappearance. In an effort to find him, I started a search covering some hundred miles up and down the faces of the mountain ranges, and cruised for four hours, coming down within two thousand feet of the peaks at intervals to keep from losing consciousness in the rarefied atmosphere.

I could find no trace of Alvarino but did lose myself over a country where the inhabitants still depend upon burros for the fastest and best means of transportation. By random flying, I found myself over a city which I could not identify. With the gas supply running low, I brought the ship down in a little field outside the village, later identified as Huancayo, east and south of Lima. When I tried to climb from the cockpit, I found that my hands and feet were frost-bitten from the extreme cold at the high altitudes above the ranges.

Fortunately, a supply of gasoline was available at Huancayo, and I was able to take off again within an hour from a field eleven thousand feet above sea level with a hundred and twenty yard runway to get me off the ground. To avoid snow and rain storms brewing in the passes, I climbed to nineteen thousand feet and set off for San Ramon, flying blind the entire trip. At my estimated destination I came down through twelve thousand feet of clouds to check my course and found myself directly over the field. Alvarino had arrived at noon in a direct course from Ancon.

We had opened the route, explored it well, and gained valuable information that has served us in maintaining the regular schedule for the portion of the route extending from San Ramon to Masisea, the small city in the jungle that we selected for our seaplane base on the Ucayali River. Additional exploration flights were made over the remainder of the route, with seaplanes from Masisea north over the jungles where we followed the solitary Ucayali, a continuous beacon and landing field, stretching out through the verdant undergrowth like a single thread of hope leading us through the relentless jungle.

On January 3, 1927, I piloted the first official flight, carrying two passengers and a quantity of mail. I had been ill with malaria, a persistent sort of a disease with which I held a continuous, pitched battle. On the days when I was victor I made exploration flights, but the exertion gave my companion enough of an advantage that I had to spend the succeeding days in bed. Our schedule was disrupted slightly by weather, but on the whole, we flew the route on established days. But here, a few hours or a day's delay does not seem material when some twenty to forty days formerly were the normal time of travel between Lima and Iquitos.

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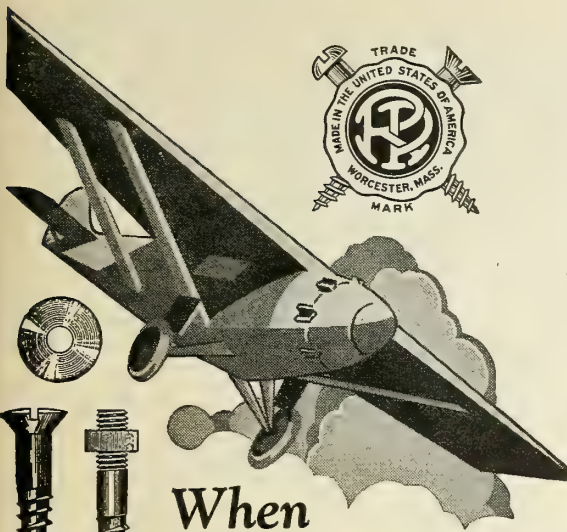
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## OUR COAST-TO-COAST FLIGHT

(Continued from page 40)

were being tended through the night and early morning by diligent friends, could not be seen. I had to rely upon my two magnetic compasses.

I stayed above the threatening clouds where flying was better, though the navigation problem was becoming more complicated. With no sextant, I was never able to determine our exact position. It was consequently necessary to trust the compass and time of flight, a dead reckoning method which is none too certain.

Twelve o'clock—oh, gosh! The motor "blooped" and sputtered, out of gas. My heart stood still! The right tank was empty, I switched to the left tank and the motor picked up, only to repeat the same procedure in a few seconds. Good Lord, what was wrong? Could there be a leak or were the lines stopped up? I couldn't imagine. "What the hell is the matter with the gas?" I yelled to Grubb and at the same time switched to both tanks. Once again the motor picked up, and by this time Grubb was busily pumping from the 5-gallon tins into the main tanks. The incident involved only about 30 seconds but much went through my brain in that short space of time. It wasn't so much the necessity of having to jump that I dreaded, for I felt secure on that issue. We were so high, there was plenty of time to get clear of the ship. I was keenly disappointed at thoughts of failure; to abandon the ship and let it be dashed to bits was something I have never done and I was sick at heart at the possibilities of this being my first time. Ah—well—everything was running all right now and Grubb never let those main tanks get empty after this little experience. I guess he had a thrill too.

Morning came with all its radiance above these clouds. I came down to 10,000 feet—and then to 8,000 feet, now just skimming the tops of these fleecy white things. All the time I was peering down looking for holes through which I might see land and get a bearing. There were no holes; these clouds were solid. What was below and where were we? At 8:00 a. m. I made a calculation of approximate average speed, time in the air, and endeavored to determine my position. Figuring conservatively, I estimated we were about at the southeastern corner of Indiana. Knowing this country was flat, I decided to mush down through these clouds blind and pick a landmark. This cloud formation was about 8,000 feet thick, and we came out below with some 50 feet ceiling. It was snowing heavily, the terrain was rugged and rather wooded. no landmarks were to be seen, and my visibility was not in excess of one-quarter of a mile.

Picking a point which was most open, I used it as a hub and flew in all directions of the compass endeavoring to get through and find a landmark to tell me exactly where we were. I was unsuccessful, each time returning to the hub to avoid loading up with ice which threatened our wings when I pushed into the sleet and snow. I was just going around in circles and, incidentally, losing time.

My knowledge of the country made me feel I was either in northern Kentucky or southwestern West Virginia. This calculation proved later to be right and I was about 100 miles south of my true plotted course.

There was no getting through and there was no safe landing place. I therefore could see no alternative but to climb up through the storm and continue on for another hour and try coming down again for bearings. This I

(Continued on next page)




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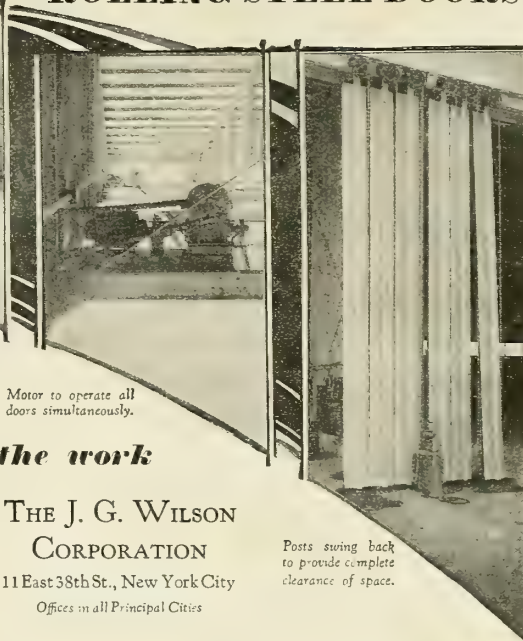
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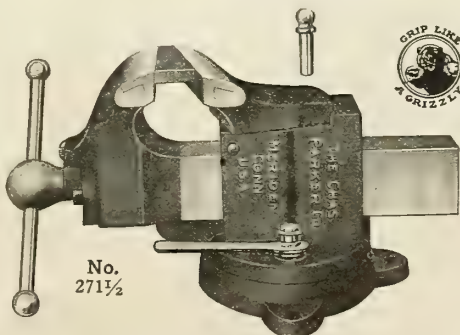
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(Continued from preceding page)

did. We attained an altitude of about 6,000 feet between two layers of clouds. We would encounter blind flying conditions every few minutes with periodic snow and sleet flurries. Riding in and out of these, for an hour, with a compass reading of 30 degrees which was north northeast, now placed us somewhere 150 miles farther on I knew, so once again I rushed down through the stormy insides of these clouds and we came out with a better ceiling and about a two-mile visibility. We were near the mountains. Again came the problem of getting through for the mountains were covered with low fog clouds and only the valley and low spots were open. After a couple of more hours of zig-zagging around, I finally pushed through, coming out slightly northwest of Washington, D. C.

I knew my directions and my approximate position all this time and pushed on by compass with the throttle now wide open to make up some for the lost time in the storms. The weather now was improving, and the continuance of our flight was a simple matter.

Soon New York loomed into view. What a pleasing sight after our night and morning of fighting the elements! Now over 17 Battery Place, up the East River, and out over Long Island. With that Wasp turning 1960 r. p. m. and while we were diving for Roosevelt Field making about 200 m. p. h., Grubb and I shook hands silently in reverent appreciation of our success.

### WHEN HAWKS SWOOPED OUT OF THE WEST

**B**RIGHT noon at Roosevelt Field! Gradually a slight clouding in the west and the February sun became a little bleaker. The flat, level field with some standing water from yesterday's rain and the faint, hazy outlines of the spires of Garden City, looked to one observer, like a small bit of old Holland, except for the intermittent roar and zoom of airplanes and the group of people standing in the lee of a distinctly American institution, a hot dog stand.

Clustered near this stand, the small group conversed quietly about sundry matters, but the frequent shifting of glances to the west betrayed where every man's thoughts were.

Occasionally, someone would stop, peer and exclaim, "Here he comes now!"

"No, it can't be; they wired that his ship has a red fuselage and aluminum wings."

Several such false starts made a fine scurrying out of their posts by the photographers and movie news reel men. Then as the hands of the clock nearly touched three, there was a little dot in sight—due west—nearer it came, like a homing dove, like a bullet. This must be Hawks. It was!

Past us with a roar. Then over he went, throwing the plane into a vertical bank, a shaft of sun striking the aluminum wings and turning them to silver. Twice in huge, tearing circles around the field, thrilling the group below. This was the real thing!

Back he went into the west again, and then at a flat slant, the plane came to ground. The official time-keeper snapped his stop-watch and the non-stop coast to coast record was comfortably broken.

There were cheers and a mad rush to surround the trim, beautiful Lockheed. Hardly heeding the yet-whirling propeller the crowd surged out to greet and acclaim Hawks.

Hawks sat nearly immobile in the little exposed cockpit. Only the flash of his strong white teeth showed his con-

(Continued on next page)

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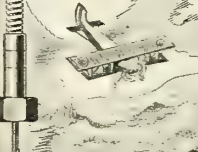
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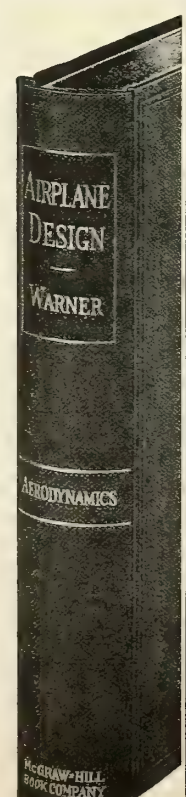
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**IRELAND AIRCRAFT, Inc.**  
Curtiss Field, Garden City, N. Y.

*(Continued from preceding page)*

siousness of victory.

Slowly he pushed up his goggles and stretched his back and neck muscles very like a man who has been slightly stiffened from falling asleep in a pullman chair. He looked about him, recognizing among the small sea of faces those whom he knew, his wife, his Texaco friends and Bill Brock and some other famous fliers who had journeyed out to Roosevelt Field to welcome and congratulate.

Then up came the heavy artillery, the news photographers, camera men and the reporters. Hawks modestly, graciously obliged.

Meanwhile, the door of the cabin had been opened and fairly stumbling into the arms of some of the spectators emerged the partner of this intrepid flight, Oscar Grubb, able and faithful mechanic.

Small wonder he had no ears for the applause—for eighteen hours he had been confined in the cabin at the non-spectacular, but nevertheless necessary, task of pumping gasoline up into the wing tanks. But soon, the strain of the flight, the numbing effects of the gasoline fumes, dropped from him and he, too, grinned with pride and pleasure as Captain Hawks grasped his hand, thanking him sincerely for his part, dragging him into the line of cameras so that he, too, could share the glory.

Then, amidst the clamoring of autograph hunters and well-wishers, Hawks doffed the coon-skin coat, and appearing in a light business suit so unlike an aviator, walked into the shack where the reporters were assembled.

In the warmth of this little room, Hawks' hearing, stunned by the eighteen hours of exposure to terrific speed, biting cold and the incessant roar of the exhaust, returned. In a frank, friendly manner he answered the questions of the eager press men—and what a story they were able to put on the wires to greet the breakfast tables of millions of newspaper readers.

Over near the window an official, opening the Barograph and handling it gingerly so as not to disturb the delicate tracings on the smoked recording cylinder, let out a low whistle of astonishment, for there was the recording of the up-and-down battle through the night, the peaks and valleys of a jagged line that showed graphically how Hawks had been looking for holes through the clouds at elevations sometimes  $2\frac{1}{2}$  miles high.

Surrounded by a still curious crowd, the plane rested in the afternoon sun. An official climbed up to measure the gasoline left—about 75 gallons still remained.

*(Reprinted from the Texaco Star)*

### THE NEW N. A. C. A. COWLING

*(Continued from page 44)*

were made to investigate the cooling and showed normal cylinder and oil temperatures did not exceed 540 degrees Fahrenheit and the oil stayed below 70 degrees C. Individual cylinders showed negligible differences in temperature under all conditions of flight, including a check climb to an altitude of 18,000 feet.

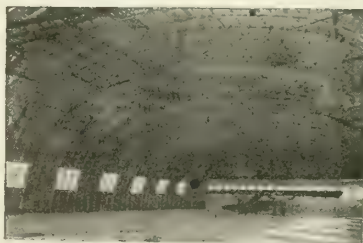
Several speed courses were then run and revealed no difference whatever in the top speed or engine r.p.m.

At this time it was decided to make the non-stop flight to New York and the streamline collector ring was replaced by short stacks extending out through the rear slot of the cowlings. This was done as a safety measure, for any failure of the collector ring on the long flight would have been dangerous.

Additional speed and cooling tests were made with the short stacks and results which checked almost exactly with

*(Continued on next page)*

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Standard sizes for U. S. Dept. of Commerce Class A—B—C airports. Also individual hangars.

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**A**FTER the war, one young pilot expressed the view that "the time would come" when the aviation industry—like the railroads and automobile business—would offer unusual opportunities for trained men.

Demonstrating his sincerity in that belief he looked down on a large part of Europe and most of the United States through a pair of non-shatterable goggles.

In 1921, after a year of flying the mail, he realized that when "the time" did come, profits would be as important as performance and hours at a desk—while not as interesting—would be almost as important as hours in the air.

In 1921 he took a job at \$35.00 a week. In 1923, he became advertising manager and assistant sales manager of an automotive accessory company at \$75.00 a week. In 1924 he joined an advertising agency at \$5200.00 a year.

Today he is advertising and merchandise manager for one of the largest automobile companies. His salary now exceeds \$10,000.00.

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For Catalog on Airplane  
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*(Continued from preceding page)*

the streamline collector ring tests were obtained.

Full credit should be given to the National Advisory Committee for Aeronautics for performing painstakingly and accurately the experiments necessary to render possible the installation of the new cowlings by commercial airplane manufacturers.

As chief engineer of the Lockheed Aircraft Company, I wish to take this opportunity to thank Major C. C. Moseley of the Western Air Express and all the veteran air mail pilots whose valuable suggestions contributed so largely to the successful design of the world's fastest air mail ship, the Lockheed Air Express.

## AIR—HOT AND OTHERWISE

*(Continued from page 50)* among them being representatives not only of all branches of the aeronautical industry, but of practically every other big business in America. Clubs throughout the country held simultaneous meetings and listened in over the radio to the proceedings of this super-meeting in New York.

The speeches have been very fully placed on record, for the newspapers recognized the great importance of the occasion. I wish we had the space in which to print them all here, but we haven't. There was "Bill" MacCracken's, for example. He was impressed by the circumstance that American air effort has so advanced that the Exchange Club feels warranted in establishing enough landing fields to make the country safe for aviation. Bill knows that only aviation can make it safe for democracy in the long run.

F. Trubee Davison roused the audience to cheers, and another voice lifted in the Song of Wings for the United States was that of Edward P. Warner, Assistant Secretary of the Navy in charge of aviation.

Postmaster General Harry S. New revealed his comprehensive wisdom again—that wisdom which so greatly has helped aviation to help America's commercial men by speeding up their business. He especially emphasized the fact that foreign governments have been creating air mail lines to and in South America for the purpose of securing trade there, and that we must meet this competition or abandon all this commerce to the more progressive Europeans.

David Lawrence, of the *United States Daily*, who gives wings to words, that evening acquired knowledge of new wings to put more words to, and said so in a worth-while speech. Merle Thorpe, editor of the *Nation's Business*, told how fully the great American commercial interests he represents editorially are beginning to appreciate the vast contribution aviation is now making to business.

J. P. Muller, first vice president of the National Exchange Clubs, in his address stated:

"Today the whole country is air-minded and realizes the value of this great adjunct to our transportation systems; and it knows it must do more than pray for the pilot's safety."

He endorsed the Biblical statement that faith without works is like a cipher with the rim off—although that is not exactly as he worded it, or as it's phrased in Holy Writ.

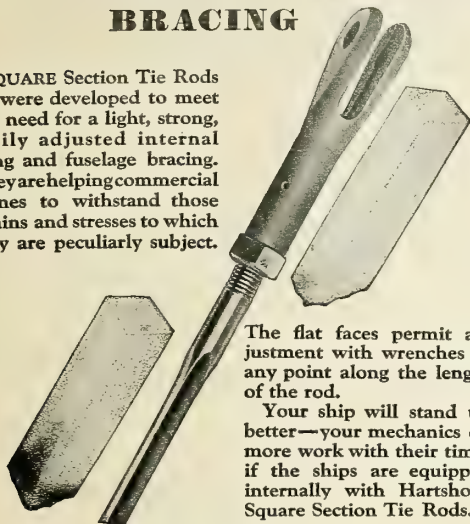
Incidentally, among the guests at this astonishing dinner were all the members of the *Question Mark's* crew. Were they cheered? There was no question mark connected with that matter. There also were representatives of every branch of the Federal air activities. General James E. Fechet had come up as the special guardian of his gallant *Question Mark* crew, and he and they were introduced to

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## SQUARE SECTION TIE RODS FOR IN- TERNAL AIRCRAFT BRACING

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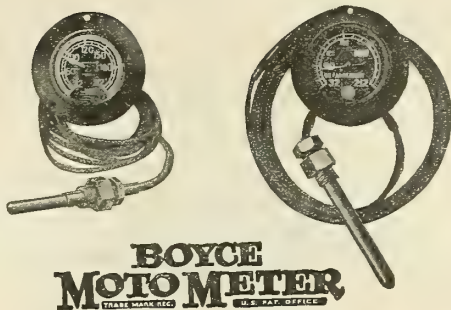


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Your ship will stand up better—your mechanics do more work with their time, if the ships are equipped internally with Hartshorn Square Section Tie Rods.

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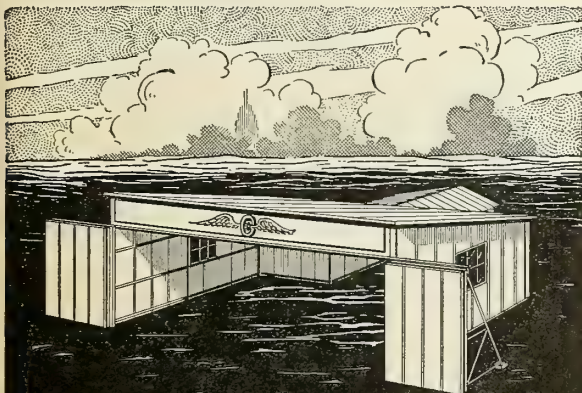
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Helmets, suits, face masks, wind cones, pilot safety belts

**CANVAS-LEATHER SPECIALTY COMPANY**

So. Broad and Dye Sts., Trenton, N. J.

(Continued from preceding page)

the eagerly listening diners by the great John Finley, editor of the *New York Times*, who acted as toastmaster.

There was in this dinner a great example for others interested in aeronautics to get into coöperation with the real leaders of American business thought and the real creators of American enthusiasm. American aviation will be wise if it endeavors earnestly to perpetuate and perfect the splendid spirit shown here at this dinner.

## SKY SLANG

(Continued from page 46)

**Revs**—Revolutions of the motor; an engine is said to "rev up" properly if it turns the propeller at the required speed. R.P.M. is revolutions per minute.

**Rubber Cow**—An airplane pilot's term of derision for a balloon or airship.

**Solo**—To fly alone. A student who is being turned solo is usually identified by a red or white flag tied to the tail of his plane by the instructor. It is a warning to all other sky-farers and a mute prayer to the Great God Luck in behalf of the soloist.

**Skid**—May be a tail skid or a wing skid but is more likely to mean skidding in the air on turns as opposed to slipping; the former is always away from the center of the run, the latter toward it.

**Sleeve**—The target towed for the Archies to shoot at.

**Splitair Turn**—Parlor nomenclature for a famous reversal performed by slow training planes.

**Sock**—The cloth cone used as a wind indicator.

**Sky Hook**—A device for anchoring airplanes to clouds; may be used also in emergencies for pulling the ship to earth if the motor quits or runs out of fuel high in the air.

**Squash**—To descend at an angle steeper than the ordinary glide and yet not to pancake disastrously; useful for short landing in small or rough fields because there is very little forward motion.

**Soupy**—Thick weather or poor visibility or both.

**Suped-Up**—A motor which has been "pepped up" beyond its normal horsepower rating by increased compression or other means.

**Taxi**—Something the girl friend always has to have; also the way an airplane has of getting from one place to another on the ground under its own power.

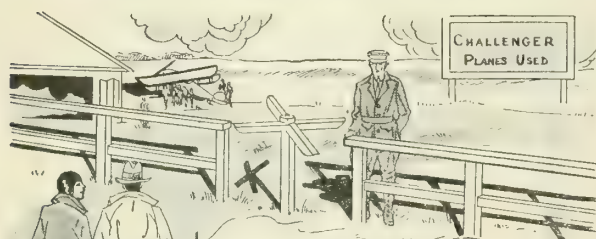
**Tee**—Neither an English afternoon habit nor a golf term but an airdrome marker, the letter "T," usually swung by the wind, to indicate the proper landing direction. **Crossing the tee** is a signal at training fields that flying is suspended and all planes should land.

**Tin Goose**—A Ford all-metal monoplane; the aeronautical counter part of the Tin Lizzie.

**Washout**—To end, knock off, wind up for finish. Borrowed from the Canadians who trained at Texas flying fields during the war. A total wreck is a washout and so is a person who in good Americanese is termed a "total loss" or a "flat tire." Not to be confused with *wash in* and *wash out* as applied to adding or taking out droop from a wing tip to alter the plane's flying characteristics.

**Wipe Off**—To shear away; usually said of an undercarriage in a bad landing when the wheels stop in a ditch and the plane slides along without them.

**Zoom**—To pull up steeply in flight at an angle beyond the plane's ability of continued climb, depending on momentum and the pilot's "feel" of his ship to bring it back into level flight just before a stall snaps it down out of control. A modified zoom is used by passing fliers as a method of salutation and greeting.



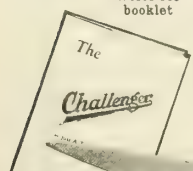
## Challenger Draws The Paying Rides!

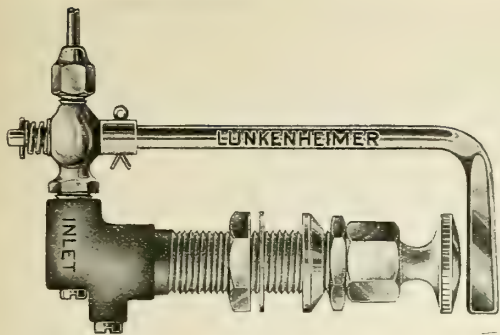
Ease of control—immediate response—slow landing—quick take off—steep, safe climbs from the smallest fields. These things have won Challenger staunch pilot preference—mark Challenger leadership even to the man who has never handled a stick.

Now passengers at flying fields everywhere are demanding their flying in Challenger planes. They sense the absolutely safe flying qualities that are Challengers'.

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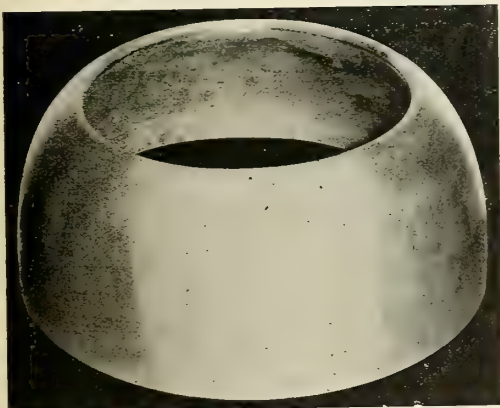
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## WELCOMING THE AVIATION INDUSTRY

(Continued from page 45)

prosperity.

When you take the individual incentive out of any job, it becomes a routine, lifeless and costly activity.

It is costly in more ways than money. If taxes were all, we, being rich, could stand the additional expense. But the sinful cost is the charge against individual endeavor, the right of each citizen to strive, and stumble, and rise again; to strive for the recognition and regard that comes to the successful. Individual reward for individual merit has made this country what it is today. It is not by accident that the United States today enjoys the most widely distributed prosperity that any country has ever enjoyed in the world's history. Nor was this prosperity brought about by any mere machinery of business such as mass production, mass selling, or mass credit. Nor by wealth of natural resources—unhappy Russia has resources equal to ours. Our prosperity is the result of a novel and truly American political and industrial philosophy—Individual reward for individual merit.

The president of the United States has said: If the people are to remain politically free, they must be economically free. Undoubtedly there is economic freedom, which, when it falls, will carry with it political freedom.

This is a threatened obstacle to our continued progress, and Aviation should join with all thoughtful citizens in seeing that this philosophy is maintained.

You can do this only by working in groups. The work of the world is done by groups today.—Group activity.

## U. S. S. "TOOTI-FROOTI"

(Continued from page 52)

ADMIRAL:

Hardly ever. I'm hardly ever sick at sea. When I feel approaching ills, I take a swig of Mother Sill's, Eat a box of liver pills, take a drink to stop the chills— And the Navy pays the bills, don't you see?

SAILORS:

And you say you never quail  
At the fury of the gale—What, never?

ADMIRAL:

Hardly ever. I hardly ever quail at sea. Should it ever start to blow, I am in my berth below, Working up a healthy glow with a tot of rum or so  
Taken dignified and slow, don't you see?

LITTLE GUTTERPUP:

And do you ever flirt with the girls?

ADMIRAL:

No, never.

GUTTERPUP:

What, never?

ADMIRAL:

Hardly ever. I hardly ever flirt with the girls. But, of course, as you might think, I occasionally wink— Just the merest little blink—if her cheeks are smooth and pink—  
(Though it may be due to drink—or the weather!)

GUTTERPUP:

Oh, Admiral! I wish you'd wink at me.  
I think that you're as nice as you can be.

ADMIRAL:

Though I have the disposition,  
My exalted high position is a sort of prohibition—  
I could give a disquisition on the awful inhibition  
That holds me back from what I want to do.

If you chance to see me winking,  
Do not let yourself be thinking that my eyes are merely  
blinking  
Or perhaps that I've been drinking. I confess that I've  
been thinking

How I'd like to have a little love with you.  
(*He winks at her and skips away, carolling gaily like a decrepit lark.*)

GUTTERPUP:

I love the Admiral bold, although he may be old.  
I'm not exactly seventeen, myself.  
He's a widower, you see; and he sure looks good to me—  
Oh Lord! I wish he'd take me from the shelf!

## SCENE 2.

*Quarter-deck of the "Tooti-Frooti." It is late at night and raining quite hard. ADMIRAL DEDHED's daughter, DOT, appears, dressed in raincoat, and walks up and down the deck, pretending not to notice LIEUT. CRAB, who is pacing along behind her. He stops her.*

CRAB:

Oh, sweetheart! Won't you give me just a smile?

DOT:

I like your nerve! You've chased me quite a while.

CRAB:

You knew I was behind you, but you never tried to run.

DOT:

I'm wearing high-heeled shoes, in which it really isn't done.

CRAB:

You know I love you, darling, though you are an Admiral's daughter.

DOT:

Well, the night is right for Naval love—we've surely lots of water!

(*She turns her face up to him and smiles mischievously. The rain-drops fall upon her upturned face. She is merely flirting with him, but he is very much in love with her.*)

CRAB:

I love you, love you only, and you fill my heart with bliss.  
I could never love another girl—'twould never be like this.

DOT (*Kissing him and laughing*):

I'll give you laughing kisses in the rain, dear boy.

My heart and lips are full of laughter.

But don't pretend that I'm your only joy,

Whom you will love forever after.

A kiss is like a morning rose besprinkled with the dew—  
But time soon dries the freshness off, and then it's stale to you.

So take my laughing kisses from my rain-wet lips—  
Then forget me as a bee forgets the flower that he sips.

(*Exit—to the nearest cabin.*)

## ACT II. SCENE 1.

ADMIRAL DEDHED's cabin aboard the "Tooti-Frooti."

ADMIRAL SINKEM is discovered seated in a soft chair,  
(*Continued on next page*)

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## AIRCRAFT INSTRUMENTS

**PIONEER INSTRUMENT COMPANY**  
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(Continued from preceding page)

chatting with ADMIRAL BILGEWATER. Both are relics of a bygone age, and even their language is archaic. They'd arouse professional interest in any undertaker. (This scene was written in collaboration with Bill Shakespeare and a bottle of rum.) SINKEM hands BILGEWATER the blueprint of an airplane.

SINKEM:

What think you of this new device  
For flying through the air?

BILGEWATER:

To me it seemeth hardly nice,—  
For flying I don't care.  
I've reached an age when I prefer  
A softly cushioned chair.

SINKEM:

A sorry wight called Bombing Bill  
Just sunk another ship.  
The wretched fellow makes me ill,  
And fills me with the pip.

BILGEWATER:

In days of old when we did fight  
The galleons of Spain  
A warship was a thing of might—  
Will those days come again?

SINKEM:

The good old days of iron ships and wooden men!  
I fear me much they will not come again.

BILGEWATER:

Perhaps 'tis just as well no more we sail the sea,  
But are allowed to park ourselves in Washington, D. C.  
Where we may slumber on and hold our jobs—  
And leave all modern fighting to the gobs.

SINKEM:

Speak lower, Bilge—we may be overheard.  
Upon this point I'll add another word:  
In days of old we sailed without a care  
Or worry over weapons of the air.  
Now we are old and use a cushioned chair—  
Exceeding soft for our posteriors.  
So we should worry over our inferiors!

BILGEWATER:

Of course, we might procure more airplanes for the Fleet,  
And make it strong enough to vanquish any foe.

SINKEM:

And could *we* fly them? No.  
For we are old and cannot learn these things—  
If God intended I should fly, he'd give me wings.

BILGEWATER:

Quite so, Milord—your point is aptly taken—  
In spite of which my confidence is shaken.

SINKEM:

And so is mine, I must confess.  
I fear our dear old Navy's in a mess.

BILGEWATER:

These few old planes we've purchased for the cruisers  
Are growing popular with all their users.  
I hope we do not have to buy some more of 'em—  
The six we have are really quite a store of 'em.

SINKEM:

But evening shadows start to fall, and I would go ashore.

I'll put this plan in the Navy files and tie it with red tape.

BILGEWATER:

Be sure thou tiest it right well,  
That it may not escape!

*The shadows close around them. The cabin grows dim.  
Enter the ghost of one CY CALDWELL, an ancient and very  
poor scrivener, long deceased.*

GHOST OF CY CALDWELL:

Greetings, gentlemen by act of Congress! Thy pardons  
both I crave

If I perchance annoy you by returning from the grave.

SINKEM:

Good Lord! 'Tis he—the fellow that I dreaded.  
I'm almost sorry now I had the wretch beheaded!

GHOST:

Sorry or not, I do not care. Besides, that's not the  
question—

I'm glad you had me killed, Milord. Life gave me indi-  
gestion.

Any who lived, as I have lived, by writing for their bread,  
Are seldom loath to quit the earth and mingle with the dead.  
But what I've come back here to say, although I may  
have digrest,

Is the same old thing I used to say when I wrote for AERO  
DIGEST.

SINKEM:

Say it—and begone, dread Shadow!

GHOST:

But first, Milord, if you'd be so kind, I'd like a little gin,  
For Prohibition is enforced in the new Sphere I am in.

BILGEWATER:

Prohibition is enforced!  
Then you are up in Heaven?

GHOST:

As usual, wise and great Milord, you do not reason well.  
Prohibition is enforced—that's why we think it's hell.

*SINKEM rings for a steward, who enters on his hands and  
knees, bows abjectly, and takes the order, returning the  
same evening—he was especially fast for a steward—with  
a tray containing three glasses. He hands a glass to the  
GHOST, who drinks and shudders violently.*

GHOST (*making a wry face*):

It's fortunate that I'm quite dead  
And fear no other fate—

This gin—or arsenate of lead—  
Would eat out boiler plate.

But listen, men, and mark it well,  
What I've come back to say:  
Your battleships you'd better sell;  
They're obsolete—passé.

In days of old they sailed the seas,  
In all their strength and might,  
But now they could be sunk with ease  
On almost any night.

So with your ancient war plans  
Go and line your tourist trunk;  
And sell your ships to Henry Ford,  
To melt them into junk.

GHOST *grins sardonically, drinks the other two glasses in  
rapid succession, winks knowingly, and fades away.*

(Continued on next page)

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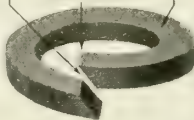
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(Continued from preceding page)

SINKEM:

My mind's unchanged, despite his say—  
I much prefer our ancient way.

*Exit, very totteringlly.*

## ACT II, SCENE 2.

*Quarter-deck of the "Tooti-Frooti." Time, morning. An inspection of the Fleet by the DUKE OF POTOMAC, ruler of the Navy. He is accompanied by the DUCHESS and all of his relatives. ADMIRAL DEDHED and the lesser fry are scraping and bowing as the DUKE comes aboard.*

DUKE:

I am the monarch of the sea,  
The ruler of this great Nayvee,  
Whose praise the country loudly chants—  
And so are my sisters and my cousins and my aunts.  
Oh! My sisters and my cousins and my aunts!

When at anchor here I ride  
I'm as bold as Captain Fried  
And never mind a foeman's taunts—  
Neither do my sisters nor my cousins nor my aunts.  
Oh! My sisters and my cousins and my aunts!

But if this Fleet should put to sea,  
Washington's the place for me—  
And all my sisters and my cousins and my aunts!  
Oh! My sisters and my cousins—  
And I've got them by the dozens—  
All my sisters and my cousins and my aunts!

They tell me that the Fleet should fly  
But I'd be nervous up so high.  
With the birds I'll take no chance—  
And neither will my sisters nor my cousins nor my aunts.  
I'm safe with my cousins and my aunts!

## CHORUS by SAILORS

He's safe with his cousins and his aunts;  
But we wonder why they started him in pants.  
As a literary chappie  
He made the kiddies happy  
And delighted all his cousins and his aunts—  
Just tickled all his cousins and his aunts.

For the *Post* he wrote a story—  
It was neither bold nor gory—  
Of a Little Duke that never took a chance.  
Like the Duke, the Bear was sappy—  
Oh! Not the least bit snappy—  
Which delighted all his cousins and his aunts—  
Simply tickled all his cousins and his aunts.

LITTLE GUTTERPUP:

Bold Sir, if you would thrill my heart  
Just tell me how you got your start.  
It never has been clear to me  
Why a former Judge should rule the sea.  
Is it due to high ambition?  
Or dire result of Prohibition?

DUKE:

When I was a lad I served a term  
As office boy in a lawyer's firm.  
I cleaned the windows and I swept the floor,  
And I polished up the handle of the big front door.  
I polished up the handle so carefuller  
That now I am the ruler of the tin Nayvee.

CHORUS by SAILORS

He polished up the handle so carefuller  
That now he is the ruler of the tin Nayvee.  
It has come to such a pass  
All we do is polish brass  
In the evenings we eat fudge  
And read stories by the Judge.  
What a lovely time we have in the Nayvee!

DUKE:

Good sailors all, if you would be  
At the very top of the Naval tree,  
Just park your hips on an office stool  
And bear in mind this golden rule:  
Stick close to your desks and never go to sea,  
And you all may be rulers of a tin Nayvee.

CHORUS by SAILORS

We'll park our hips on a cushioned chair,  
Use Blisterine upon our hair,  
Never curse, and never swear—  
And *never* go up in the air—  
(It isn't done in the Navy.)  
And then perhaps in time we'll be  
The rulers of the deep blue sea,  
And live in Washington, D. C.  
Until we're old as old can be—  
That course is quite the gravy!

ACT III. SCENE 1.

*The U. S. Fleet, led by the "Tooti-Frooti," and commanded by ADMIRAL DEDHED, is discovered cruising off Timbuctoo. The speed of the Fleet is about 12 knots, the speed of the slowest supply ship. Radio operator approaches ADMIRAL DEDHED with a message.*

OPERATOR:

The King of Timbuctoo has radioed to you  
Just what he'd like to do for diversion.  
Though he's not feeling sore, he suggests we have a war,  
As he has a flock of bombs for dispersion.

DEDHED:

You can tell that bird from me, that I rule the raging sea;  
And his message seems to be an aspersion  
On the power of my fleet, so I'm very glad to meet—  
And consider it a treat—an excursion.

OPERATOR *departs to send message. Fleet now steams up and proceeds at full speed—almost 13 knots. Flying Fleet of Timbuctoo appears on the horizon and rapidly overtakes Dedhed's fleet. The "Lexington" and "Saratoga" are ordered to tow the slowest ships, while the anti-aircraft crews stand to their guns. They sing:*

You can't stay up! Oh, you can't stay up  
When we want to bring you down.  
We're full of snap; we want a scrap—  
We're men of high renown.  
We always aim and hit our game  
We're never known to miss.  
We love to shoot some poor galoot—  
It fills us full of bliss.

*They fire at the enemy air fleet, which is now directly overhead. The shells burst, missing the airplanes, but the fragments fall all around the ships, causing all on deck to run for cover. Song by anti-aircraft men continues, softly*  
(Continued on next page)

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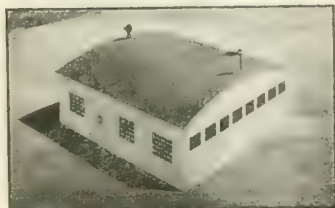
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(Continued from preceding page)

now, and with much feeling:

Oh, that was unexpected! We're really quite dejected.

Those planes should be subjected to a shock.

Our shooting is perfected—those shells must be infected!—

They should have been rejected on the dock.

ADMIRAL DEDHED *cheers his men with this one:*

A Yankee gob is a soaring soul, as free as a coo-coo bird.

His energetic fist should be ready to resist

A dictatorial word.

His heart should glow and his manner show

His fist was ever ready for a knock-down blow.

Yo, ho! My lads, we'll knock 'em!

We'll pummel 'em and sock 'em!

With T N T we'll shock 'em.

With anti-aircraft rock 'em—

Eradicate or block 'em!

Yo ho, my lads! Yo ho!

At the second "Ho!" bombs begin to drop around the ships, to the amazement of the Admiral. The SAILORS gather around and sing this little ditty while a few of the ships start to sink, slowly and with great dignity:

It's quite all right to shock 'em, to rock 'em, block 'em, sock 'em.

But have you noticed they're up there

And we are down below?

We'd love to go and fight 'em, to fight 'em, blight 'em, bite 'em—

An elevator's what we need.

For jumping is so slow.

Lieutenant Crab leaps aboard the Navy's airplane—a huge battleplane called a "Jenny"—and is catapulted into the air. One of the enemy fighting planes dives at him. The enemy pilot instantly drives poor Crab into the sea by throwing bananas at him.

SONG by SAILORS

(Sung very pathetically):

He loved the Admiral's daughter.

And now he's in the water.

We fear that he is getting very wet.

Still, he doesn't mind such things

For he has his water wings—

And they're the modern sailor's safest bet.

DEDHED:

I fear my Fleet is sinking in the drink!

Now, how can I preserve it? Let me think.

Get up steam to beat the band;

Leave the ocean for the land—

For once ashore my ships can *never* sink!

CHORUS by SAILORS

We defy you, flying men who seek our blood!

For we go to park our warships in the mud.

When we get our boats ashore

You can't sink us any more.

We're as safe as old man Noah in the flood.

The Fleet steams for shore and runs aground, where the Sailors leap ashore with shovels and proceed to camouflage the stranded ships by covering them with earth. Little Gutterpup and the Admiral's daughter are busy cutting up potatoes, which the Sailors take and plant on the decks. In no time at all, hardly, a good crop of potatoes is springing up—for in that tropical land things grow fast. Lieut.

*Crab comes swimming ashore—he was a little late, for he had forgotten to grease himself.*

CRAB to DOT:

This Naval life will drive me barmy;  
I think I'll go and join the Army.  
I never cared a lot for swimmin'—  
Except at Coney with the wimmin.  
And now we've lost our only plane  
I'll never go to sea again.

DOT:

Then you're tired of my kisses, my laughing, teasing kisses  
That I gave you every evening when it rained?  
Oh, what a sad day this is, for the Navy and the misses!  
I've loved too well—I should have been restrained.

*(She starts to cry)*

CRAB:

Oh, darling! You are charming.  
Don't cry—you're quite alarming!  
I shall stay and kiss you every time it rains.  
Ladies' tears are so disarming.  
I must stay and take up farming  
In the Navy—we'll grow corn and other grains.

*(Each takes a hoe and begins hoeing out weeds that are annoying the new potatoes growing on the quarterdeck.)*  
*Enter Admiral Dedhed and Little Gutterpup.*  
*He winks at her.*

DEDHED:

My exalted high position has been shot.  
Am I an Admiral now? Or am I not?  
Will you please explain to me, my little peach,  
Exactly my position on this beach?

GUTTERPUP:

The Duke of Potomac will claim  
That you are the person to blame  
For the sunken condition, peculiar position  
The Fleet now enjoys. It's a shame!  
But still, you need show no alarm—  
The Fleet makes a beautiful farm—  
We'll keep ducks and shoats in these little life-boats,  
And run the whole thing like a charm.

DEDHED *(very gaily and happily)*:

At last no high position  
Is an awful prohibition on my sunny disposition!  
No more I'll disquisition on the fearful inhibition  
That held me back from making love to you.  
For now I am a farmer, and I love this little charmer.  
I hope I don't alarm her—and she knows I'll never harm  
'er—

She knows that I shall never be untrue.

SAILORS, *dropping their hoes*:

What,—never?

DEDHED:

Hardly ever. I'll hardly ever be untrue.

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We've sailed the ocean blue, aboard the "Tooti-Frooti,"  
But now we're farmers true, all feeling smart and snooty.  
Although our Navy is aground, which fills us full of grief,  
We don't care much. We'll hang around and ask for  
farm relief!

So yo-ho! my lads! Yo-ho for the ocean blue!

All sailors will be farmers in 1942.

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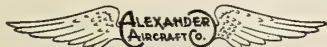
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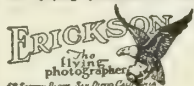
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Let us send you AERO DIGEST regularly . . . there's always something interesting happening and AERO DIGEST covers it all.



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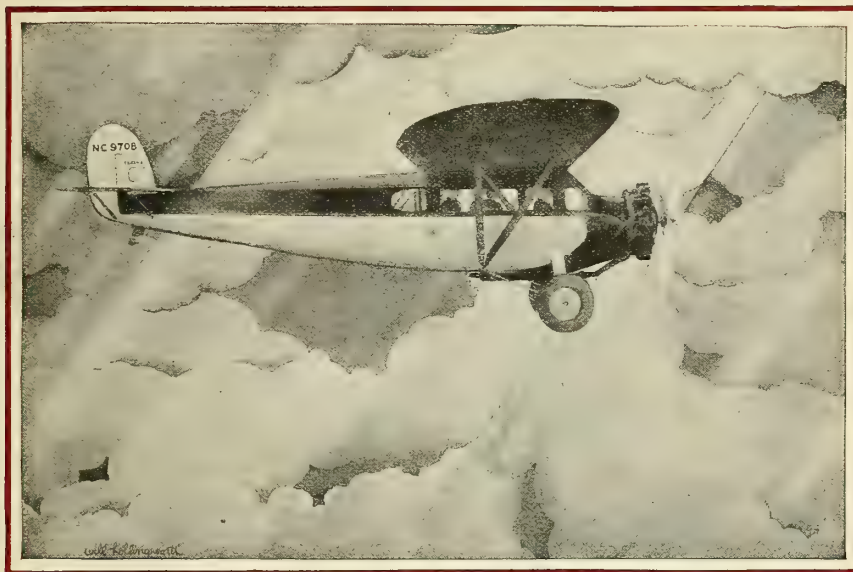
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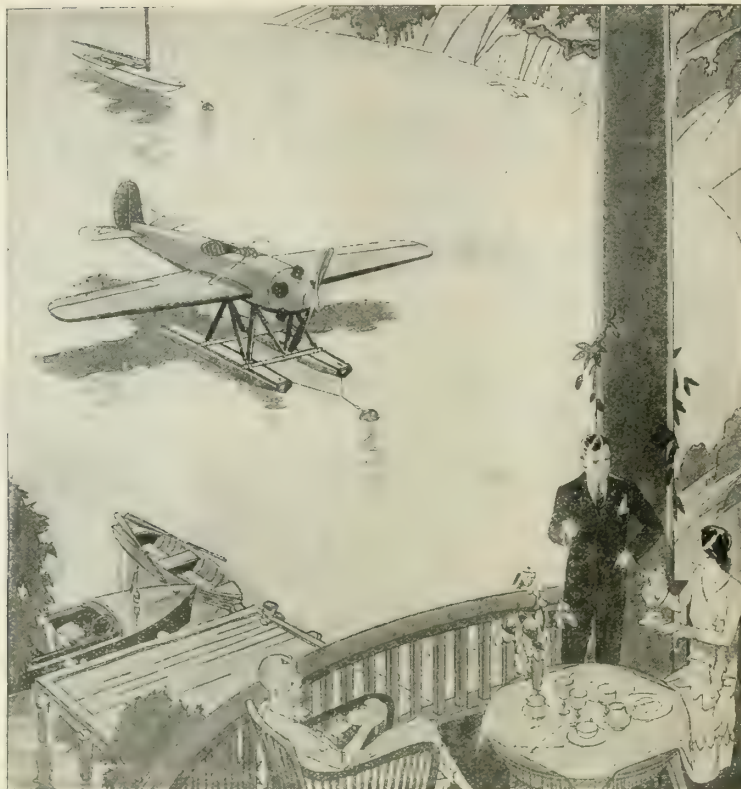
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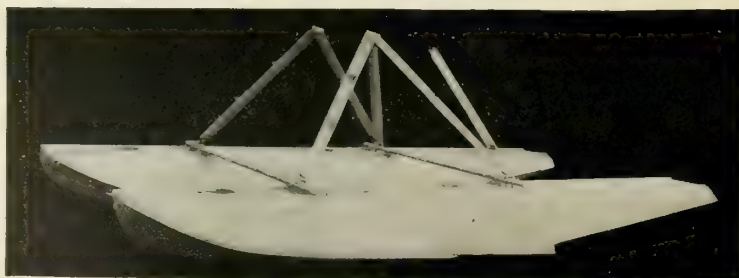


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*Number Two of a Series  
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**A**N INSTITUTION is the lengthened shadow of the men responsible for its policies and product. Sound management is the most important single factor in the successful conduct of any business.

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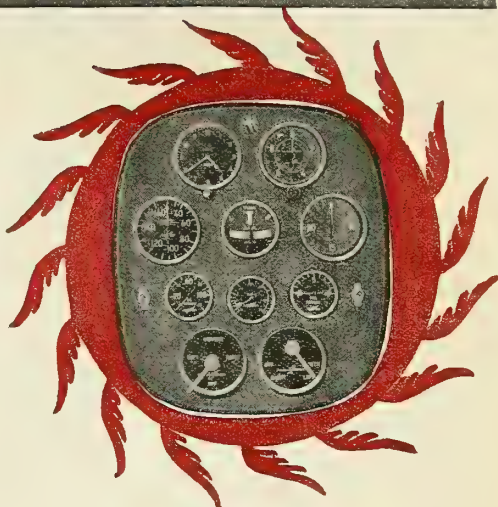
And remember this: No matter what model you choose—no matter what price you pay—American Eagle will give you the very utmost in safety, in structural refinement, in unfailing performance!

See the American Eagles at the Detroit All-American Show. We will have an interesting proposition to make to dealers and distributors at that time. Or, if you are not coming to the show, write to us.



*American Eagle planes are powered with motors from 40 to 225 h. p. and are priced from \$1,895 to \$18,895. Illustration shows the 3-place biplane, the cabin monoplane, the two-motored cabin monoplane, and the sport biplane with folding wings.*

**AMERICAN EAGLE AIRCRAFT CORP.** FAIRFAX AIRPORT  
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Consolidated Custom-Built Instrument  
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**S**PEEDING high over an ever changing landscape of oddly molded hills and checkered dales, modern airplanes of comfort and luxuriousness are now equipped with equally distinctive Consolidated instrument panels, custom built to individual specifications of owner or builder.

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THE PLANE"**



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# ANNOUNCING *The* PARKS PLANE

## BUILT— for Superlative Performance

A lively interest grips the eager group that waits expectantly one clear and frosty morning at the Parks Airport. The maiden flight of a new ship is about to commence.

It is a ship made to meet the mighty need of pilots who turn hopefully to each new plane expecting to find those things that experience has taught them to want. Will it fulfill their hopes.

**"Here she comes!"**

The hangar doors open to reveal the first Parks plane. It is the P. 1. biplane, powered with a *Parks super OX5* motor—a trim and sturdy ship of pleasing plan. Trundled onto the field, it seems to rest equanimously in a way that emanates confidence. Every detail of construction—every line—strength—beauty—accuracy of design—all give promise of great performance. Its plump parted cowl, breasted like the strong chest muscles of a thoroughbred. Its short but expansive wing spread—deep full fuselage—broad round empennage—sturdy spreader-bar landing gear. These are the characteristics that catch the appraising eye of the air man and immediately gain his approval. Contact! The "tuning up" commences.

A beautiful plane—yes. But the proof is in the flying. Seated at the controls is a long experienced Parks' pilot, serene in the knowledge that this is a ship designed for the pilot—just as he would like to have it. The blocks away, she taxis proudly into position—deliberate and confident as the great "Man-o'-War" going to the post.

**"There she goes."**

"Roaring to a short take off. Tail up—she lifts—hangs to the prop—up—up—up—up. How that ship climbs." Cricked necks and straining eyes watch this new Icarus frolic and cavort in the meadows of the sky. A succession of loops. Then a slow, graceful roll—a spin—out again—all with apparent ease. Throttled down to a speed far too slow to keep the average plane aloft, she flies steady, sure. Opened again—more rolls, loops, spins,—promise is fulfilled—surpassed.



HERE SHE COMES

A ship made to meet the mighty need of pilots who turn hopefully to each new plane expecting to find those things that experience has taught them to want. The Parks does because it is a made to order ship embodying features contributed by pilots with 25,000 hours of flying experience.

**Dealers: Perhaps your territory is still open**

## FROM— The PILOT'S ANGLE

Experienced opinion carefully gathered and wisely correlated cannot go wrong. That is why Parks turned to the instruction pilots of the



largest air college in the world in gathering the specifications for a new line of airplanes—reliance placed in men who sit in the cockpit of the training plane hours on end—men who have piloted airplanes of every kind from the veriest crate to the best of modern construction. Men who learned the business of flying in pushers and Jennies of war days and in the lumbering, slow footed standard. Men who flew the speedy pursuit ships and roaring bombers—who pulled navy seaplanes "up on the step" and into the air—who lived the life of the gypsy flyer making his landings and take offs from cramped stubble fields and open meadows in the woodlands. These are the men from whom Parks Aircraft, Inc. systematically drew the qualities that every pilot would demand of his airplane were it designed by an organization absolutely in touch with his desires.

# A New Line of Airplane

From a 2,000,000 dollar Corporation  
Contributing 75 years of manufacturing experience

**P-1 BIPLANE**

**P-2 BIPLANE**

**P-3 CABIN 4 PAS.  
MONOPLANE**

**P-4 CABIN 6 PAS.  
MONOPLANE**

**Built for  
Superlative  
Performance**



## FAR IN ADVANCE

The need was simply expressed by those wind-bronzed, keen-eyed fellows of the instruction staff of Parks Air College. They gave their valuable advice.

"*Strength first* they said. You've got to know that your ship will hang together under the hardest kind of abuse."

The Parks plane will.

"*Performance next*. You want a ship stable but maneuverable, reliable and steady, sensitive and responsive."

That's Parks'.

"*Appearance too*. Clean of line, fleet of appearance, room in the cockpit, with an instrument board well arranged and easy to see."

Parks' satisfies.

Added to the Parks plane—strong as a steel girder—fancy in performance as a polo pony—trim as a sailing yacht—there is one more adjunct—an organization that keeps a step ahead of aeronautical progress, with a finger on the pulse of flying ready to seize improvements and incorporate them.

### SPECIFICATIONS P-1 BIPLANE

Parks super OX-5 motor	Total wing area, 296 sq. ft.
Length over all, 24 ft. 1 in.	Aileron area, 30 sq. ft.
Height, 9 ft. 4 in.	Stabilizer area, 20.3 sq. ft.
Span, 30 ft. 1 in.	Elevator, 17 sq. ft.
Dihedral, upper wing, 1 degree; lower wing, 2½ degrees.	Rudder, 7.5 sq. ft.
Stagger, 14 in.	Fin area, 4 sq. ft.
Gap, 61½ in.	Weight, empty, 1170 lbs.
Chord, 63 in.	Gas and oil, 224 lbs.
	Useful load, 812 lbs.

## CONCLUSIVE RESULT OF 25,000 HOURS OF FLYING

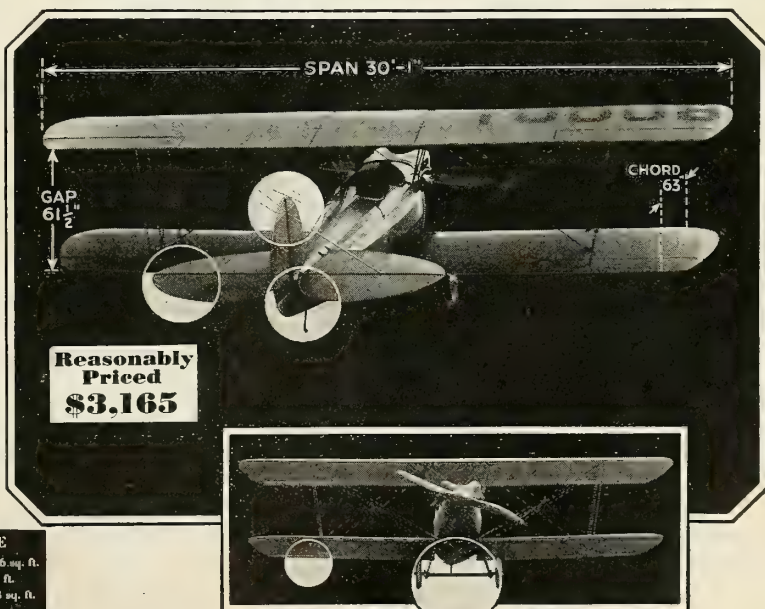
The Parks is a good landing ship—practically lands itself. A superlative performer, not oversensitive on the controls, yet highly maneuverable—spins nicely and comes out easily—rolls adroitly from level flight and actually gains altitude in a loop—will remain aloft at an unbelievably slow speed.

### Construction Features

1. Broad wings—large areas.
2. Wide range adjustability of stabilizer, adaptable for any load.
3. Axle type under carriage with spreader-bar—no side thrust—won't throw tires, or break wheel.
4. Sturdy revolving tail skid that will stand up under rough landings on hard ground.
5. Tin faring stream-lining the drag where aileron joins with wing.

### Performance Features

1. Makes a short take off.
2. Can be put into a slow roll from a straight flying position—comes out of a spin or slip easily. Actually gains altitude in a loop.
3. Large control flippers—make it nimble.
4. Because of position of stabilizer, you can still fly if flippers fail.
5. You can feel pressure on ailerons.
6. Stays in air at remarkably slow rate of speed.



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MO. THEATRE BLDG., ST. LOUIS, MO.

**Write for information about our attractive offer**





The aircraft industry knows the Bohn Ring True Bearing is a safe bearing.

This product is specified by all the leading engine makers because they know of Bohn's wide bearing knowledge. The authoritative manner in which raw metals are purchased—the scientific handling of the various heats—the precision and understanding of the alloys—all combine to place this organization in a more advantageous position as a bearing source.

"You're safer with Bohn Ring True Bearings" has become a slogan among pilots.

*Aircraft Division*

**BOHN ALUMINUM & BRASS CORP.**

DETROIT, MICHIGAN

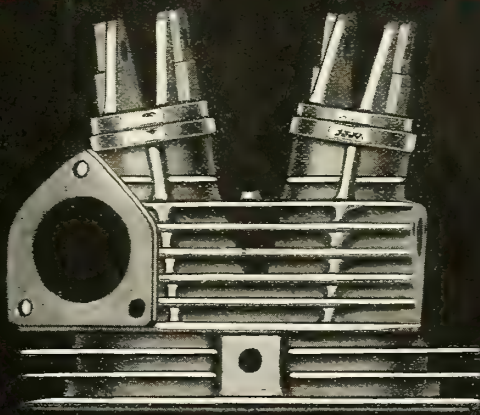
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# Cylinder Head

made of

## BOHNALITE



## A Master Part by Master Craftsmen

Here is a new cylinder head made of Bohnalite which this organization recently produced. It is a particularly fine casting, yet it is but one example of scores of safety aircraft parts made by Bohn aeronautical experts.

Bohn patterns are models for exactness and precision. For years Bohn pattern makers have been drilled in aircraft dimensional accuracy and the thoroughness of this training is reflected in Bohn quality castings. Bohnalite castings are better because they are safer.

*Aircraft Division*

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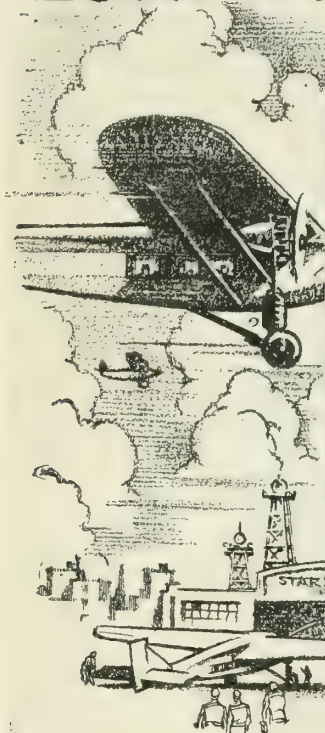
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# 62% Lighter than Iron



# How would you like a Half-Hour's interview with Walter Hinton about Your Future in Aviation?



## Walter Hinton Was

Pilot of the famous NC-4, the very first plane to fly the Atlantic; first Aviator to fly from North to South America; first to use a plane for exploration. In the Eleanor III, he explored 12,000 square miles of Brazilian jungle from the air and flew to the source of the Amazon River. During the war, he was one of the crack flying instructors for the U. S. Navy. 400,000 miles of flight, under practically every conceivable condition, are behind the training Hinton gives you.

## Walter Hinton Is

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## Hinton's Ready to Talk to You NOW

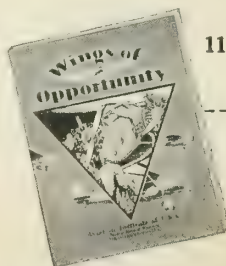
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"What kind of 'ground jobs' are open?"

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"What training is needed to get into the REAL MONEY class?"

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## This Is Exactly What Hinton Is Doing

Through a remarkable course of instruction—Hinton is preparing ambitious, far-sighted men right at home for the wonderful opportunities in the various branches of Commercial Aviation.

Whether you want a ground job or a flying job—you MUST HAVE training.

And that's what Walter Hinton will give you.

Without sacrificing your present job or investing a lot of money, you can get Hinton's help. That means the ground work training, PLUS his personal advice and cooperation and the FREE assistance of his Employment Bureau which is placing men in real jobs at real pay, right along.

"Wings of Opportunity" is ready to tell you HOW and WHY. Just tell us on the coupon that you're ready to listen.

### You must be over 16

To take an active part in Aviation you must be at least 16 years of age. If you are under that, please do not ask for Lieut. Hinton's Book.

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Walter Hinton, President

1115 Connecticut Ave.

Washington, D. C.

## Rush to Washington

Walter Hinton, President, Aviation Institute of U. S. A., 1115 Connecticut Avenue, Washington, D. C. 1028  
I want to know what you think about MY future in Aviation. Send my FREE copy of "Wings of Opportunity" quick.

Name .....

Street .....

City ..... State ..... Age .....  
Must be over 16

SAFEST - SWIFTEST - LARGEST







KEYSTONE PATRICIAN

## The AIR LINER for the NEW DAY in air transportation

THE Keystone PATRICIAN was built to meet the urgent need of the larger transport lines for planes of vastly greater speed, increased cargo capacity, quicker take-off and satisfactory performance at high altitudes.

That the PATRICIAN meets all of these needs has been strikingly demonstrated on its record-breaking tour, now nearing completion. In a flight of many thousands of miles, twice spanning the country from coast to coast, numerous cities have been visited—scores of pilots have been given the opportunity to fly this great ship and have marvelled at the ease with which it handles—transportation executives everywhere have witnessed its swift flight, its unequalled capacity for

SPECIFICATIONS • KEYSTONE • PATRICIAN			
speed 151 m. p. h. 	20 passengers 	payload 3880 lbs 	ceiling 17400 feet 

passengers and freight, its distinguished appointments for luxury and convenience.

To established air lines, the PATRICIAN will bring increased business, improved schedules, greater profit. Moreover, this newest and greatest giant of the air carries with it all the assurance of reliable performance that specialized experience in building multi-engined planes, meticulous care in manufacture, high engineering skill and great resources alone make possible.

### KEYSTONE AIRCRAFT CORPORATION

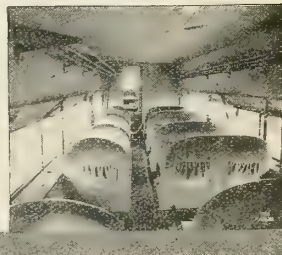
Sales Dept.—31st Street and East River, New York

Plants—Bristol, Penna., and New York City

California Representative: W. E. Thomas, 3417 Angeles Mesa Drive, Los Angeles



Above—Entrance to the Patrician  
Right—Front view of the Patrician showing 90-foot wing spread



Above—Capacious cabin of the Patrician, equipped with every convenience. Private compartment forward end at right.







# Trailing Clouds of Glory

Aviation is a settled industry. The glory is won. The Pioneering is done. Science and Engineering will lead on. The scientist and engineer are both "Gentlemen from Missouri" . . . "You have to show them." They stand together as a bulwark protecting this new and wonderful step in advancing civilization. Safety, time, economy, profit are their watch words. Technical merit alone satisfies them.

Out of the fire, from off the test block, down from the service ceilings, tried on mail and transport lines in Canada, in Florida, Naturaline emerges, the super aviation fuel.

Naturaline is made from 100% Natural Gasoline and is not doped or blended with any other medium. With a high gravity, low initial, extremely high percentage over at 212° F (indicating unusual volatility) with, at the same time, no tendency whatever toward vapor lock, it is easily understood why Naturaline operates so smoothly and gives such perfect combustion in the modern type of aviation motor.

These qualities make it the pure, quick starting, complete burning, powerful, smooth, light weight fuel so desirable.

## NATURALINE

**NATURALINE  
COMPANY OF  
AMERICA**

Chestnut and Smith Bldg.  
TULSA :: OKLA.



# AIRCRAFT DEALERSHIPS

Aircraft dealerships offer the same sources of definite and generous profits as did the early automobile franchises . . . . Provided, of course, that the proper dealership be selected.

The Flamingo is sold under two merchandising plans. One for established dealers, similar to the automobile franchise plans. The other an unique plan useable by dealers, or by those not now engaged in aircraft marketing, **which involves no preliminary commitment.**

The following facts concern the advantages of Flamingo dealerships:

1. Public opinion prefers and will shortly demand all metal aircraft because of the practical absence of fire hazard and the greater safety factor.

2. Transport operators prefer allmetal aircraft because of its negligible maintenance and depreciation costs.

3. The simplified fabrication and production methods employed in the manufacture of the Flamingo permit its sale in the same price and performance range as the old types of construction.

4. The demand for transport planes exceeds the present supply. This is not true of the lighter type of sport and training ships. The market for transport planes is of much wider and more diversified scope, offering easier and more attractive profit margins to dealers.

5. In the field of transport planes the Flamingo stands pre-eminent in saleability because of its adaptability to practically any class of service, its low maintenance and

depreciation, its attractive economy of operation—in short, its unquestioned utility.

6. The Flamingo market will be always stable. Alert departments of engineering and commercial research guarantee that Flamingo design and merchandising methods will always be in advance of competition.

7. The experience and resources of twenty-six nationally known financiers assure the continued solid foundation of the Metal Aircraft Corporation of Cincinnati.

8. The Flamingo is an allmetal, high-wing, cabin monoplane comfortably accommodating six passengers and pilot—powered with either the Pratt and Whitney "Hornet" or "Wasp" engines—cruising at 115-120 mph—top speed 132-135 mph.

9. A request on your letter-head or a personal visit to our booth at the All-American Aircraft Show, Detroit, April 6-14, will bring complete information on our plans of merchandising and dealership.

## ALL METAL *Flamingo*

METAL AIRCRAFT CORPORATION  
OF CINCINNATI, OHIO  
LUNKEN AIRPORT



# FLIGHTEX

**40°-50° BELOW ZERO!**



Used on Commander Byrd's "Aristocrat" and Fairchild, now in the Antarctic

**104° ABOVE ZERO!**



Used on the Pan-American Airways' Sikorsky which Colonel Lindbergh flew to the Canal Zone

Flightex is the outstanding all-weather, all-temperature covering for wings, fuselages and empennages on over 75% of the planes at the Detroit Show. Visit the Flightex booth. Flightex offers a fine, smooth surface for high finishes. Well known commercial and military planes are Flightex covered.

**E. J. TWINING & CO.**

**320 BROADWAY  
NEW YORK CITY**



## Look to Goodyear!

"Let's ask Goodyear" says the designer, and mails the blue prints. "Put it up to Goodyear," says the builder, and sends the pattern. "Goodyear will give us the answer," says the pilot, and calls for tire data.

No matter what the question, if it pertains to airplanes and *rubber*, look to Goodyear for the answer. The correct answer.

Goodyear's veteran and skilled aeronautics department is at the service of aviation. Any problem you present gets immediate sympathetic attention from a corps of experts who have grown up with the airplane. Simply write, wire, telephone, or come personally.

*Aeronautics Department*

GOODYEAR, AKRON OR LOS ANGELES

*You are cordially invited to visit the Goodyear display at the Detroit Aircraft Show*





## PLANE PERFECTION!

SPEED ..... 120 M.P.H.  
 LANDS ..... 35 M.P.H.  
 TAKES OFF ..... 100 FT.  
 CLIMBS ..... 1000 F.P.M.  
 CEILING ..... 20,000 FT.

*With 90 HP. OX-5*

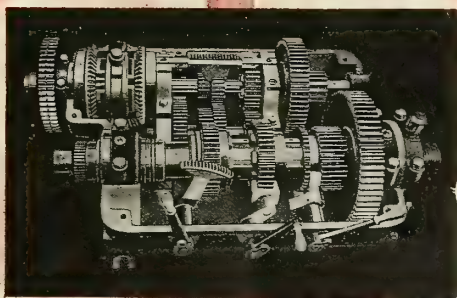
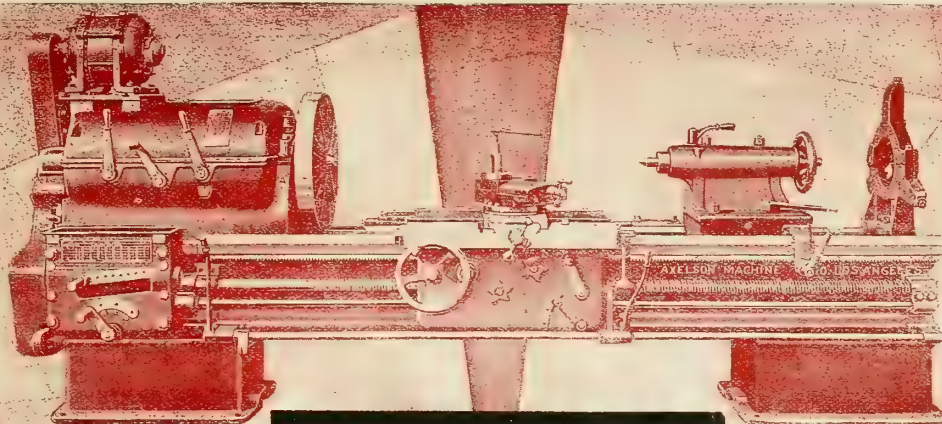
**MORE PERFORMANCE PER HORSEPOWER.**

**"BIRD" 3 PLACE BIPLANE**



Displayed at the All-American Aircraft Show, Detroit, April 6-14  
 Dealers . . . . . Your Opportunity!

**BRUNNER - WINKLE AIRCRAFT CORPORATION**  
 17 Haverkamp St., Glendale, Brooklyn, N. Y.



# PRECISION LATHE BUILDING

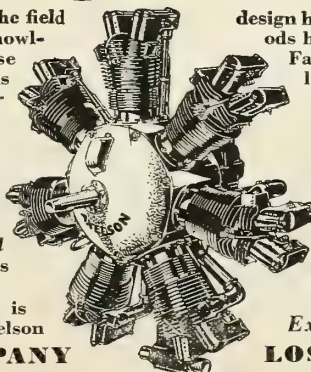
*a contributing factor to*  
**master engine building**

**F**OR many years Axelson Lathes have led the field in accuracy and sustained service. The knowledge gained in the manufacture of these dependable Lathes and other precision tools contributes in no small measure to the finer elements of accuracy, precision and standardization that predominate in Axelson Airplane Engines.

For 37 years the Axelson Organization has been engaged in the manufacture of precision tools and equipment. Entrance into the production of Airplane Engines is a logical sequence that permits investment of this mature experience to the fullest extent. Axelson experience is a definite force that is reflected in every part of the engines. Axelson

**AXELSON MACHINE COMPANY**

*Airplane Engine Division*



design has been proved and reproved. Axelson methods have been tested to the very limit of science. Fatigue resistance, chemical reaction, life limits, tolerances...every conceivable factor required in the manufacture and finish of each part has been predetermined.

Simplicity in Axelson Engine design is a feature apparent to even the layman, but impellingly impressive to the trained service mechanic.

The life tests now being conducted have already revealed endurance and staminal qualities that are little short of astounding.

Engineering data will be supplied on request.

**Exhibiting at the Detroit Show.  
LOS ANGELES, CALIFORNIA**

*Post Office Box 337*

The following planes, Axelson powered, are being exhibited at the Detroit Show: Command-Aire, Travel Air, Spartan, Swallow and American Eagle.

# AXELSON AIRPLANE ENGINES





CAPTAIN WALTER C. DAVIS AND ASSOCIATES  
ANNOUNCE THE ORGANIZATION OF THE—

# Davis Aircraft Corporation

BUILDING THE

# DAVIS

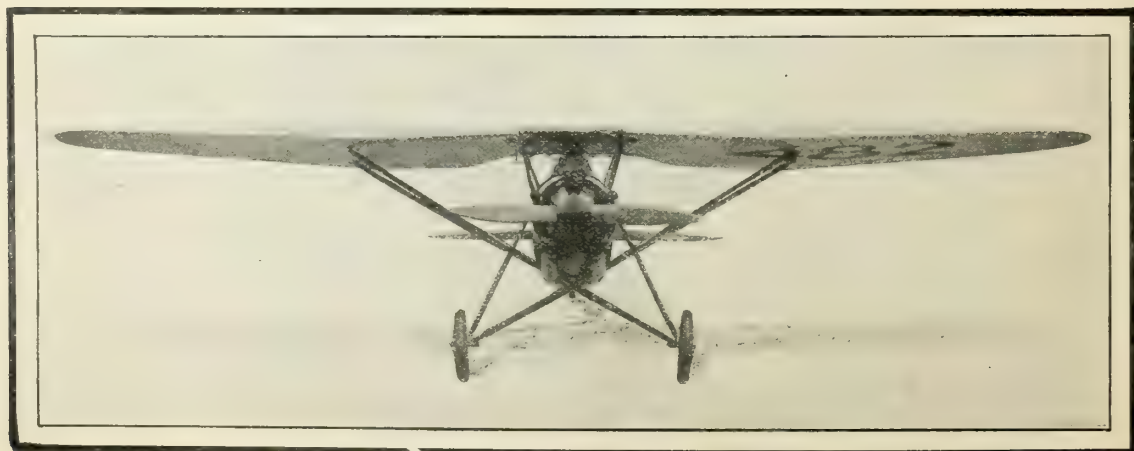
A 2-PLACE HIGH WING

THE Davis Aircraft Corporation has purchased the Vulcan Aircraft Company, and its product "The American Moth." This plane, with certain improvements, is now in production as the *Davis Monoplane*, in the modern factory of the Davis Aircraft Corporation, at Richmond, Indiana.

The Davis Monoplane—then known as The American Moth—took first place among Class A planes in the Los Angeles-Cincinnati Air Derby, and second place in the New York-Los Angeles Air Derby—conclusively demonstrating its air-worthiness and exceptional perform-

ance. The only changes which have been made in the Davis Monoplane since that time are those which experience has shown to improve its already remarkable qualities.

With ample financial resources, a skilled manufacturing and technical staff, and management which has been actively interested in aviation for more than fifteen years, the Davis Aircraft Corporation is pledged to the constant improvement and development of a plane which is particularly adapted in flying characteristics, low operating costs, and moderate price, for school purposes and the private owner.



THE DAVIS is a light monoplane, built particularly for school instruction and the private owner of moderate income, who wants to fly his own plane—and take a companion with him.

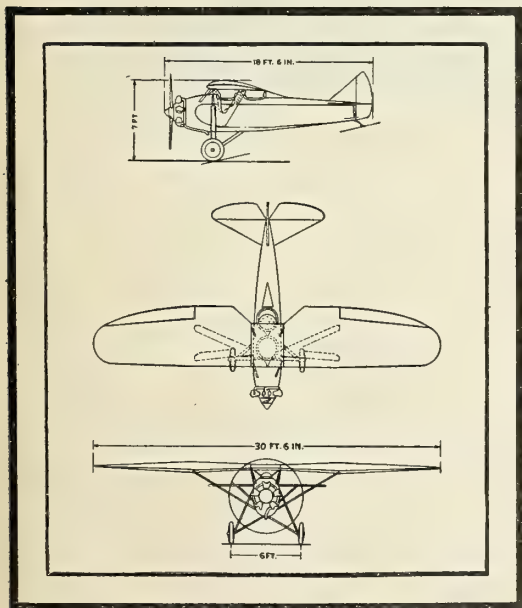
Embodying aero-dynamic principles hitherto undeveloped in a plane of its type and class, the Davis Monoplane possesses performance characteristics, maneuverability and *stability in rough weather*, far beyond previous experience. Structurally, the Davis

Monoplane meets all Department of Commerce requirements, with large safety factors. With the exception of wing spars and fabric covering, it is of all-metal construction throughout.

Clear vision, quick takeoff, unusual stability, and conservative landing speed contribute to safety in the hands of the student pilot. Low maintenance and operating costs appeal alike to the private owner and the flying school.

# MONOPLANE

MONOPLANE—"THE AMERICAN MOTH"



\$2965, F. a. f., Complete

*Flyaway at Field*

## PERFORMANCE (Actual)

Service Ceiling.....	10,000 feet
High Speed.....	95 M. P. H.
Landing Speed.....	40 M. P. H.
Cruising Speed.....	80 M. P. H.
Cruising Range.....	350-400 Miles
Fuel Consumption (at cruising speed).....	4½ gallons per hour
Climb.....	700 ft. per minute

## SPECIFICATIONS

TYPE—2-Place, Tandem, Dual Control, Open Cockpit, High Wing Monoplane.

POWER PLANT—LeBlond Radial, 60 H. P. at 1950 R. P. M.; Hartzell wood propeller.

WING—30 ft. 6 in. span; 145 sq. ft. area; airfoil, Gottingen 387 at lift struts, modified to Clark Y at center section and at wing tips; tapered. Laminated spruce box spars; Dural ribs.

FUEL CAPACITY—25 gallons.

TAIL SURFACES—Elevators, 12 sq. ft. Rudder, 6 sq. ft. Adjustable Sta-

bilizer, 9½ sq. ft. Vertical Fin, 3½ sq. ft.

LENGTH OVERALL—18 ft. 6 in.

HEIGHT—7 feet.

WEIGHT, EMPTY—770 pounds.

PAYLOAD—350 pounds.

DISPOSABLE LOAD—540 pounds.

NORMAL WEIGHT, LOADED—1300 pounds.

CONTROLS—Dual, stick and rudder bar. Equipment: Consolidated Instrument Panel Including tachometer, altimeter, oil pressure and temperature gauges; tools, emergency kit and fire extinguisher.

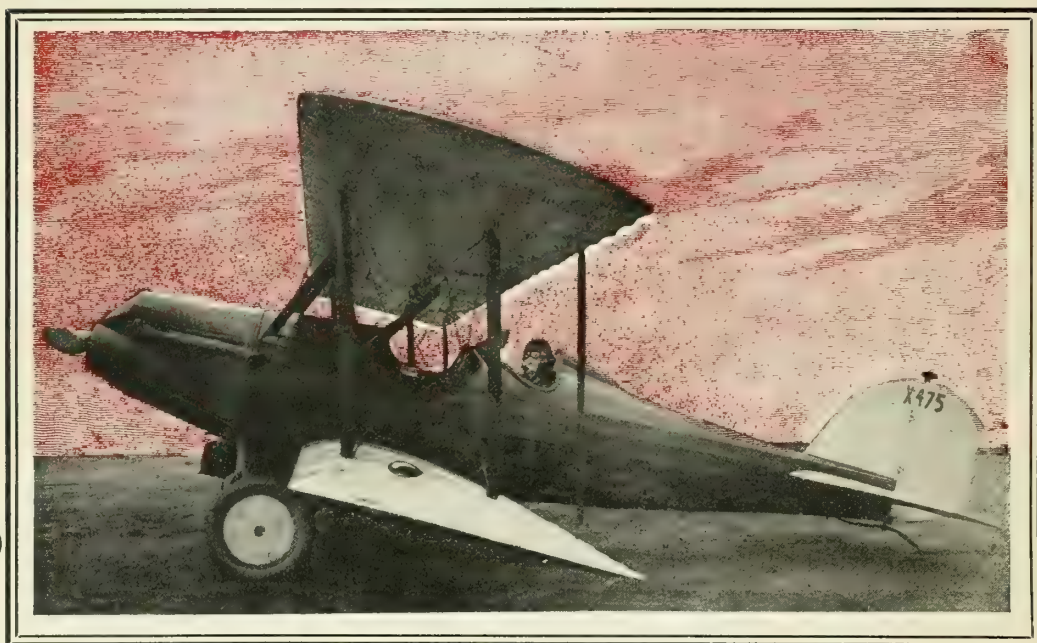
# DAVIS AIRCRAFT CORPORATION

Richmond  
Indiana





# Introducing . . . The TA·HO·MA



## Aviation's Latest Biplane Production

### SPECIFICATIONS

Length Overall.....8 ft. 5 in.  
Span .....32 ft.  
Weight, Empty.....1390 lbs.  
Gross Weight.....2740 lbs.  
Gasoline Capacity.....60 gal.  
Price (less motor).....\$2500

### PERFORMANCE

High Speed.....125 m.p.h.  
Cruising Speed.....105 m.p.h.  
Landing Speed.....35 m.p.h.  
Rate of Climb.....1000 f.p.m.  
Power Plant.....optional



ON display to the public for the first time, at the All-American Aircraft Show, the new three-place TA·HO·MA Biplane will stand conspicuous for its numerous up-to-the-minute safety features. Prominent among these features is the all steel tube system of controls; no wires are used.

And coupled with safety is comfort. Both cockpits—front and rear—are large, carefully shielded from the wind and well upholstered. The pilot's cockpit, especially, has been designed for easy access to all instruments, even when heavy winter flying togs are worn.

Open territories for reliable dealers and distributors are now available. Write for exclusive franchise rights, liberal discounts and factory co-operation.

### STANDARD EQUIPMENT

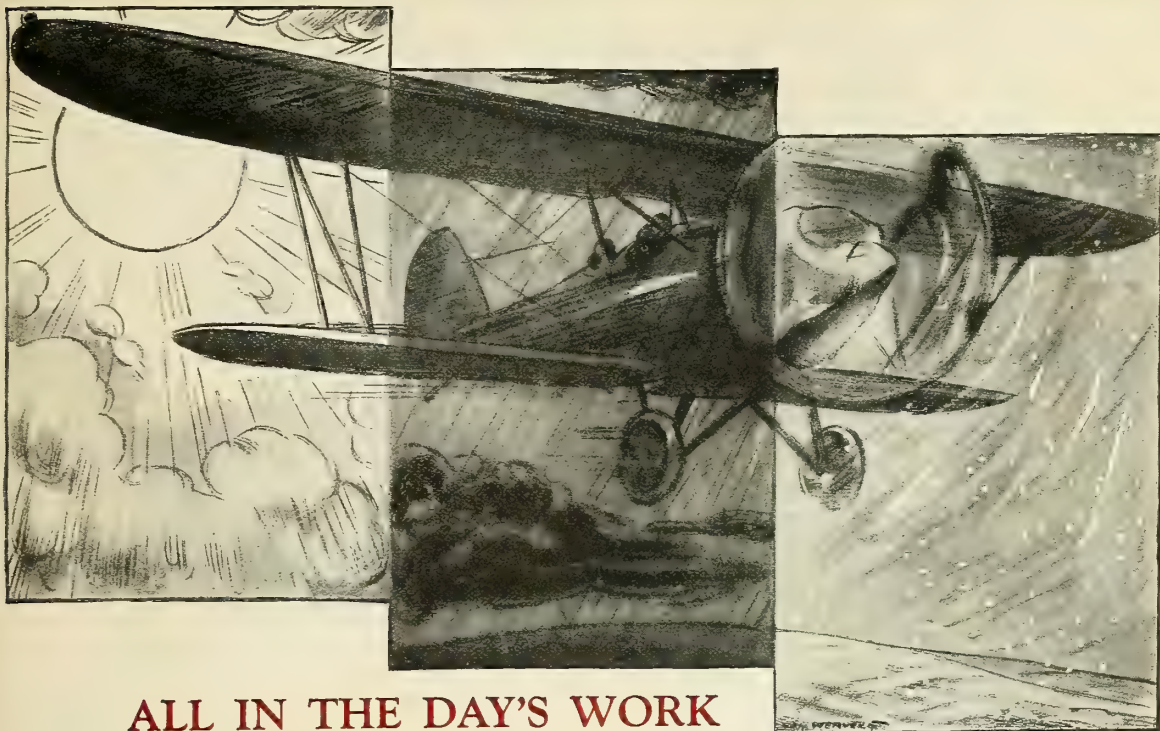
Dual Control; Fire Extinguisher; Safety Belts; Navigating Lights; Hydraulic Shock Absorbers; Lockheed Brakes; Solotex Fabric; Delphine Finish; Firestone Tires; dual instrument boards, each of which contains: Tachometer, Altimeter, Gasoline Gauge for each tank, Compass, Air Speed Indicator, Switch, Choke.



*Inspect our ship at the All-American Aircraft Show, Detroit, April 6-14*



*TA·HO·MA Aeroplane and Motor Co., 64 West Randolph Street, Chicago, Ill.*



## ALL IN THE DAY'S WORK

**T**HROUGH sunshine or rain, fog, sleet and snow, -TP- Aero Motor Lubricating Oil keeps the engine running smoothly. It provides a margin of safety when unexpected weather conditions mean extra hours in the air.

-TP- Oils are the latest development in scientific lubrication. They have been tested and approved by leading manufacturers of airplane engines and by many leading pilots. They are produced from pure, paraffine-base crude by a process for which patents are pending.

This process has marked advantages over other methods. It removes all the paraffine wax, while preserving all the lubricating bodies in the crude. There is positively no blending of light and heavy oils to produce various viscosities.

In terms of performance this means uniform viscosity at all working temperatures, minimum carbon deposit and ignition trouble from fouled spark plugs, easy cold priming, immediate oil pressure, perfect lubrication winter and summer, on the ground or at high altitudes—a maximum of safe flying hours.

A handsome, practical Pilot's Log Book sent free on request. Please use the coupon.

TEXAS PACIFIC COAL AND OIL COMPANY  
FORT WORTH, TEXAS

New York

St. Louis

Los Angeles

### -TP- Aero Rocker Arm Lubricant

A pure, paraffine-base, low-cold-test, mineral-oil lubricant. Free flowing—will not carbonize. Send 50c for 1-pint trial can.



## -TP- AERO MOTOR LUBRICATING OIL

PATENT PENDING

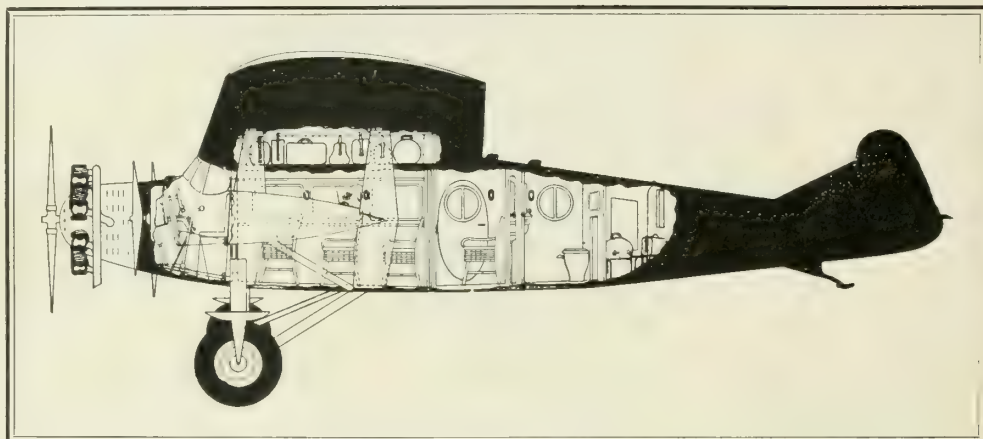
Texas Pacific Coal and Oil Company, Fort Worth, Texas  
Please send me, without obligation, your Pilot's Log Book.

Name \_\_\_\_\_ Address \_\_\_\_\_

Your Oil Dealer's Name \_\_\_\_\_

2714





Fifty to one hundred fifty miles an hour

Dividend paying qualities are engineered  
and fabricated into the Bach Ten Place  
Tri-motor Transport.

BACH AIRCRAFT COMPANY, INC.

Los Angeles Metropolitan Airport

Van Nuys, California

# Know Flying

*It's new*

Only  
\$1<sup>00</sup>/<sub>100</sub>



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**Roth-Downs Airways, Inc.**  
Saint Paul, Minnesota

## Read What Others Say:

"Congratulations on your marvelous book 'The Modern Airplane.' I am studying to be a pilot. I have read many books on aircraft and motors but I find that your book is by far the best. By best I mean that one can understand it more clearly." Paul Daniel Mahan, 535 St. Anne's Ave., New York City.

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Here's my dollar. Rush me postpaid a copy of "The Modern Airplane."

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Address .....



# A NEW BIRD TAKES WING

## *The* **Cardinal**



### **BIG SHIP FEATURES SMALL SHIP COST**

LeBlond engine  
Molybdenum fuselage  
Direct control  
Adjustable stabilizers  
Brakes and shock absorbers

### **THE PLANE FOR TWO**

The Cardinal was designed  
to meet public demand for  
economical air transportation.  
See this quality plane at  
the Detroit Show.

*Sales Franchises available . . . write us.*

## **ST. LOUIS AIRCRAFT CORPORATION**

SUBSIDIARY OF THE  
**ST. LOUIS CAR COMPANY**

8000 NORTH BROADWAY  
**ST. LOUIS, MO.**



**PORTERFIELD TRAINING IS YOUR GREAT-  
EST ASSURANCE OF EARLY SUCCESS**

Every phase of Aviation is vitally important. The industry must have properly trained specialists. Your choice of an Aviation school, therefore, is a vital decision. You must choose a school which gives you the type of training the industry demands. Porterfield Flying School offers you advantages to be found in no other civilian school. We give you thorough training in the genuine atmosphere of the industry. Our classrooms are the shops and field of one of America's leading aircraft manufacturers. Our instructors are experts who are active leaders in the industry and our equipment is the best available. Porterfield courses from the beginning have conformed strictly with the requirements recently announced by the Aeronautical Chamber of Commerce. Our instruction has been designed to meet the specific demands of aircraft manufacturers and operators. That is why Porterfield students are making good in the industry and that is why the industry places its confidence in Porterfield students who have taken advantage of the splendid opportunities offered them in their early training.

*Complete  
Theoretical  
and Ground  
Training*

*Thoroughly  
Modern  
Planes and  
Equipment*

PORTERFIELD FLYING SCHOOL, INC.,  
1435 Grand Avenue, Kansas City, Mo.

I want complete information about your expert training which will assure me success in commercial aviation. Please send me "A Flying Message."

Name .....Age.....

Street .....

City .....State.....

**PORTERFIELD FLYING SCHOOL**  
*Kansas City - Missouri*





Boeing Mail-Cargo Plane (Model 95)

*The speediest, heavy payload, commercial single-engined plane on the market*

# Boeing Announces:

## The new mail-cargo plane that 3 $\frac{1}{3}$ million miles of flying developed

### SPECIFICATIONS:

Approved Type Certificate No. 106  
Engine—Pratt & Whitney "Hornet,"  
525 hp.

### PERFORMANCE

(With 1,610 Pounds Pay Load)

High Speed	(Propeller Setting, 16°)	140 mph
High Speed	(Propeller Setting, 17°)	142 mph
Landing Speed		56 mph
Rate of Climb (ft. per minute)		950 feet
Climb in 10 minutes		7,350 feet
Time to 10,000 feet		15.4 minutes
Service Ceiling		16,000 feet
Take-off Run		540 feet
Take-off Time		11.6 seconds
Wing Loading		11.9 lbs. sq ft
Power Loading		11.1 lbs. hp

### DIMENSIONS

Span	44 feet 3 inches
Length overall	31 feet 11 inches
Height overall	12 feet 1 inch

### WEIGHTS

Empty	3,196 pounds
Pilot	170 pounds
Fuel (130 gallons)	767 pounds
Oil (12.5 gallons)	97 pounds
Actual Pay Load	1,610 pounds
Gross Weight Loaded	5,840 pounds

*This plane will be exhibited at the  
Detroit Aviation Show and a model  
will be sent on a tour of important  
cities.*

DESIGNED from experience gained flying 7,000 miles daily over "the longest airplane laboratory in the world" Model 95 proves itself in the forefront among mail-express-cargo planes by virtue of SPEED, HEAVY PAY LOAD, (1610 pounds), QUICK TAKE-OFF, LOW LANDING SPEED, ECONOMICAL OPERATION.

Other conspicuous advantages of this outstanding plane include: Operation equally well at sea level or 12,000 feet; at sub-zero or tropical temperatures; minimizes night flying difficulties; has rapid servicing features; added comfort and safety and visibility for the pilot; location of four mail-express compartments to obtain the maximum loading with rapid handling of pay load.

These are BUT A FEW of the advantages this new model offers operators seeking a dependable, economical, revenue producing cargo plane, which will be "on the job" every day.

Due to its superior performance over any other large capacity high speed carrier, Model 95 has been placed on the trans-continental air mail route, a merited indorsement.

OFFERED FOR IMMEDIATE DELIVERY

# Boeing Airplane Company

Division of United Aircraft and Transport Corporation  
Seattle, Washington

8A3

# Epochal Flights by

Lindbergh  
Byrd  
Chamberlin  
Earhart  
Goebel  
Wilkins  
Hawks  
Maitland-  
Hegenberger

## Aviation-Proven Piston Rings

THE conditions to which piston rings must be subjected in aeronautical uses are far more exacting than any others.

Not only that but they are crucial uses, since life itself is often, if not usually, dependent upon such piston rings.

For many years, U. S. Hammered Piston Rings have been accepted as standard for aeronautical purposes. They played their important parts in carrying Lindbergh to Paris and they have likewise functioned perfectly in dozens of other historical flights of primary importance, including those of the other pilots mentioned above.

Today, U. S. Hammered Piston Rings are the outstanding piston rings of aviation and are used in the motors of:

Aircraft Engine, Inc.  
Alliance Aircraft Co.,  
Curtiss Aeroplane & Motor Co.  
Pratt & Whitney Aircraft Co.,  
Wright Aeronautical Corp.,  
and many more.

U. S. HAMMERED PISTON RING CO.  
Irvington, N. J.

Put your aero  
piston ring prob-  
lems up to us.  
"If It's a Piston  
Ring, We Can  
Make It."

*Oil Shall  
Not Pass*







## A New-Day Conception of *Safety and Performance* — by Nicholas Beazley!

Picture a low-winged monoplane, streamlined for grace and speed—eager to charge straight up a sunbeam!

Step into this plane and take off—with a very short run. In a few seconds you are in the air;—in one minute you are 1200 feet skyward, in eight minutes 8000 feet. Then forward, you sweep the sky at 105 miles an hour.

You are in the Barling NB3!

All metal structure gives unbelievable strength to this new, low-winged monoplane yet it is lighter by many pounds than other planes of equal ability. Fast as an arrow, it consumes no more fuel than a small motor car! Power it has

in abundance—from a small 60 horse-power Le Blond Engine. Performance with this small power plant far exceeds that of the average ship of this capacity with twice the horse-power. Steadiness? When you fly the Barling NB3 you will believe Elliott White Spring's remark that "Anyone not blind or minus both arms can fly". Unlike the average small ship, it does not require an experienced pilot—because of its patented wing construction and the advanced method of applying the dihedral angle. Hands-off flying with perfect ease—even in rough air—is no feat at all in the NB3. And you land like a feather floating to rest.

# BARLING



Safety has been assured by eliminating wires, turnbuckles and other lesser parts. The U-spar wing has no point of vulnerability. This construction, coupled with exceptional maneuverability, makes the NB3 eminently reliable.

Most surprising of all is the price. The only all metal structured, three-place monoplane in the United States for less than \$10,000, the Barling NB3 is yours for only \$3,600, flyaway.

**PERFORMANCE DATA:**—(With useful load—613 pounds) .... Top speed—105 miles per hour or over. .... Cruising speed—87 miles per hour .... Service ceiling—10,000 feet .... Absolute ceiling—15,000 feet .... Cruising—5 hours or 435 miles .... Climb to 12,500 feet—45 minutes.

**SPECIFICATIONS:**—Span—32 ft. 6 in. .... Chord—5 ft. 2 in. .... Area, Wing—159½ sq. ft. .... Area, Tail surfaces—25 sq. ft. .... Dihedral—5 degrees .... Length—21 ft. 6 in. .... Height—6 ft. 10 in. .... Weight—690

lbs. (empty) .... Total weight—1303 lbs. (loaded) .... Useful load—613 lbs. .... Wing loading—8.3 lbs. per sq. ft. fully loaded with pilot, two passengers and full of gas and oil.

**EQUIPMENT:**—Dual Control .... Adjustable Pilot Seat .... 24x3 SS Tires ... Wings wired for navigation lights .... First Aid Kit .... Fire Extinguisher .... Dash Carburetor Choke Control .... Dash Carburetor Altitude Adjustment .... Altimeter .... Tachometer .... Oil Pressure Gauge .... Oil Temperature Gauge .... Air Speed Indicator .... Dual Ignition Switch, front and rear ... Gasoline Gauge ... Tie-down hooks on wings .... LeBlond 60 h. p. Engine .... Engine tools .... Wood Propeller .... Cockpit Covers.

*There are still several territories available to financially responsible distributors who can qualify to handle this New-Day Plane. All inquiries should be addressed to our Manufacturing Division.*

**NICHOLAS-BEAZLEY AIRPLANE CO., Inc.**

*Manufacturing Division*  
**MARSHALL, MISSOURI**

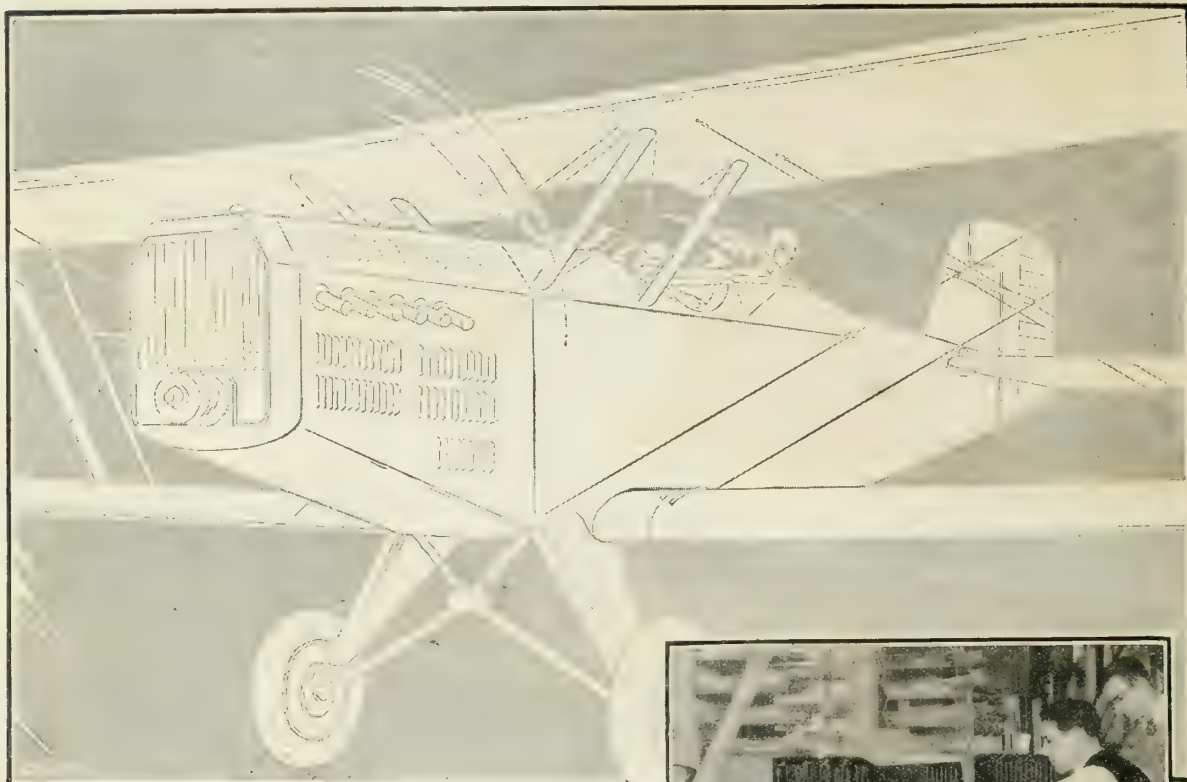
**NB3 Monoplane**



FIRST AROUND



THE WORLD



## *Dependable Production Equals Dependable Performance*



A POWERFUL motor drones . . . a whirling prop gleams in the sunlight . . . and another Douglas ship is ready for delivery. Douglas engineers have contributed their combined experience and knowledge. Douglas craftsmen have completed their skillful work, yet it is only now that one Douglas department's work begins to assert itself.

From the most unimportant nut and bolt to the all-important wing fittings and fuselage metals Douglas has erected a standard for quality materials that exceeds even rigid government specifications.

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**DOUGLAS**  
**AIRCRAFT CO.**  
**INCORPORATED**  
*Santa Monica California*

Douglas's determination that this standard for quality shall be adhered to is expressed by the fact that the Douglas Material Control Department, supervised by Gordon Brown, checks and rechecks all material specifications to assure that no material other than that of supreme quality shall enter the Douglas production line.

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# Canada ! *without stop* To Cuba

a great flight  
a perfect test  
of a great oil



BELLANCA AIRCRAFT CORPORATION

NEW CASTLE, DELAWARE

U. S. A.

HAVANA, CUBA  
February 23rd, 1929

Kendall Refining Company  
Bradford, Pa.

Gentlemen:

I wired you this afternoon advising you of our landing here in Havana, Cuba, at 4:45 P.M., completing the first non-stop flight from Canada to Cuba, which incidentally is the first time the United States has ever been crossed without landing.

On this flight we carried two hundred fifty six gallons of gas and fifteen gallons of your Kendall "J" Penzbest oil. Before leaving Canada I specified Kendall oil because of the highly satisfactory results which I have had from using your oil in the past two years. Upon landing here we had our oil drained and find that we still have twelve and three-fourths (12 3/4) gallons left, which means that our consumption for the twelve hour and fifty five minute flight was only nine (9) quarts, or considerably less than one quart per hour.

Leaving Canada this morning in below zero weather and landing in Cuba this afternoon with the thermometer well over ninety degrees (90°), to my mind is giving Kendall oil a good test. While the oil temperature varied from sixty degrees in Canada to one hundred thirty degrees on landing here, the oil pressure remained at sixty five pounds throughout the flight.

Allow me to take this means of expressing my appreciation of the highly satisfactory Kendall service which is given at all the airports where I have landed and assure you that we are using Kendall exclusively at our Bellanca Factory.

Very sincerely,

GEORGE W. HALDEMAN



**George W. Haldeman**  
*flies from sub-zero weather  
to Summer's heat with*  
**KENDALL PENZBEST OIL**

ON February 23, 1929, George W. Haldeman, with James Hayden, mechanic, completed the first non-stop flight (four times previously attempted by others) across the U.S. from Canada to Cuba, arriving at Camp Columbia Field, Havana, at 4:45 P. M., from Windsor, Ontario. Plane: Bellanca C-H; Distance: 1404 miles; Time: 12 hours, 56 minutes; Total oil consumption: 2 1/4 gallons; Oil: KENDALL PENZBEST.

The start, at Windsor, was made at 3:40 A. M. at sub-zero temperature. The famed ability of Kendall Penzbest Oil to circulate instantly and to withstand the congealing influence of bitter cold, must have been an invaluable ally in starting the plane on its way to the distant mark. Down the Florida coast and across to Cuba, Kendall Penzbest, as expected, did not thin out and lose body—the oil pressure remained at 65 lbs., assisting a magnificent flight to a triumphant finish.

The remarkably low oil consumption of 9 quarts in 12 1/2 hours of flying, is typical of Kendall Penzbest performance, insuring uninterrupted, efficient lubrication, added power and perfect protection to the motor.

Derived from the Bradford Grade of Pennsylvania Crude, second to no other in the world, super-refined without acids, Kendall Penzbest is made available to aviation as the finest oil for every test and for every Season of the year.

For a list of airports where Kendall Penzbest is now obtainable, address Aviation Division, Kendall Refining Co., Bradford, Pa.



# KENDALL PENZBEST MOTOR OIL



REFINED FROM 100 % BRADFORD  
GRADE OF PENNSYLVANIA CRUDE

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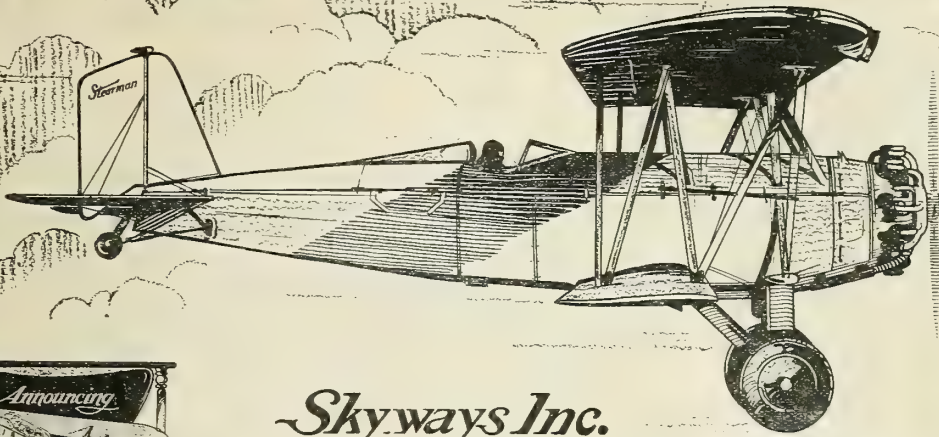
New York    Ft. Worth    Detroit    San Antonio    Wichita    Tulsa    Shreveport    Oklahoma City    Houston    Dallas

LOS ANGELES, CALIF.

Municipal Airport, Brownsville, Texas

Photo by Edgar Tobin Aerial Surveys

Say you saw it in AERO DIGEST



Our announcement  
March 16th issue Air  
Transportation.



Our announcement  
March 23rd issue  
Aviation.



Our announcement  
April issue of *Airway*  
Age.

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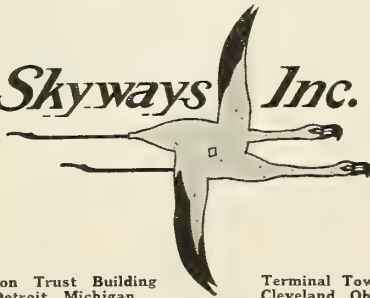
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These pre-eminent fine performance planes are too well known to require detailed description.

They will be on display and demonstrated by us at the Detroit Show, April 6th to 13th.

# Skyways Inc.



If unable to attend, the comments of our experienced pilots are obtainable in a folder published by us for your perusal.

Send for it

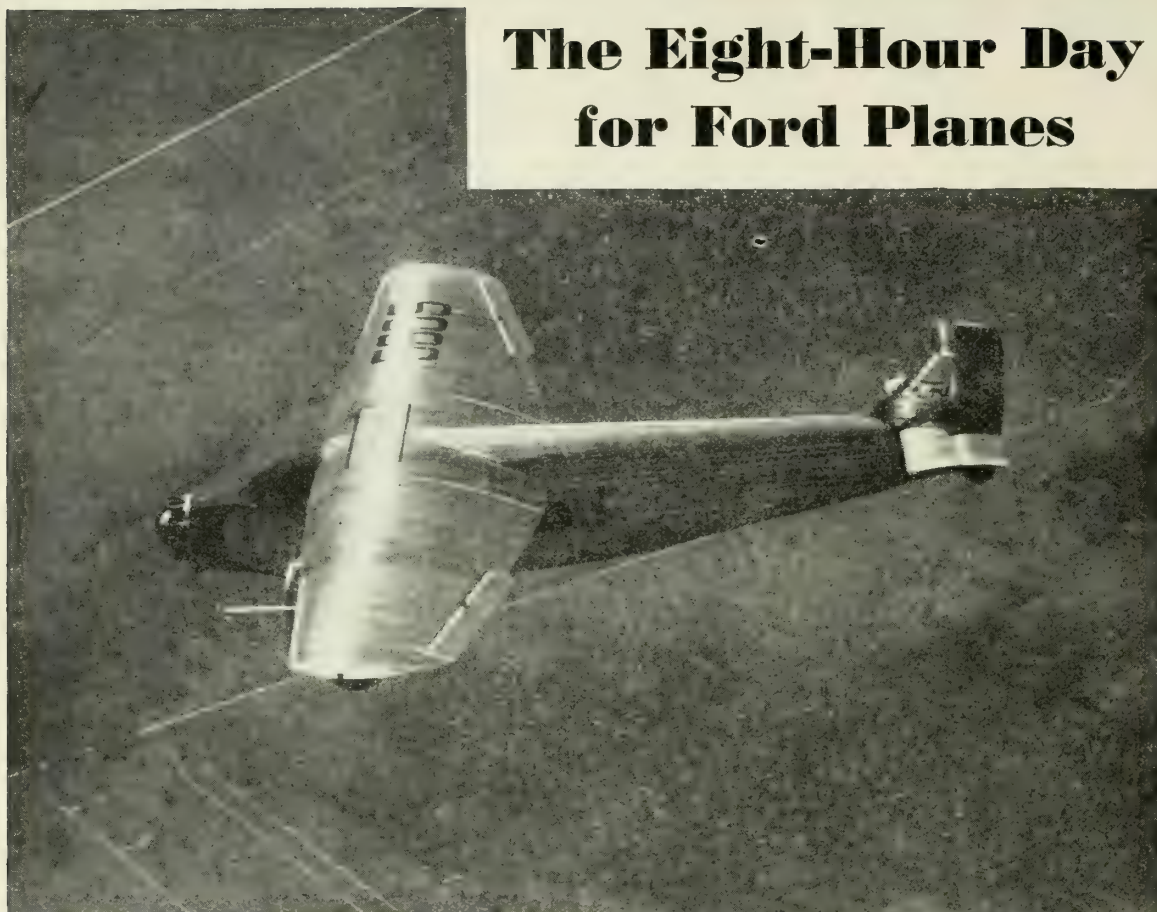
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Detroit, Michigan

Terminal Tower  
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## The Eight-Hour Day for Ford Planes



NORTHWEST Airways schedule their Ford planes for a round-trip flight between Chicago and Minneapolis-St. Paul every day. The trip each way takes about four hours. They assign their Ford planes a daily eight-hour duty.

Stout Air Services fly a plane from Detroit to Cleveland in the morning, use it for sightseeing during the day, and then fly it on the scheduled Cleveland-Detroit flight that evening. The plane from Cleveland does the same thing in Detroit. These planes are averaging close to eight hours daily—even more in the summer when daylight is longer.

This kind of performance, day in and day out, results from the all-metal construction of Ford planes. Every structural member is of *known* strength, and that strength is measured to meet a known stress. As a consequence continuous work does not bring uneven wear or produce chronic failures in parts of maximum wear. Every single part of the plane is able to do its full share of work every day.

Only because they do obtain service free from disrupting troubles and adjustments, repairs and replacements, can owners of Ford planes deliberately schedule their planes for such a high average amount of flying. Knowing they can get that performance so certainly,

they are able to operate with a minimum number of planes and keep the money they *do* invest in planes working at high efficiency.

Your planes are earning only when they're working. Nobody knows the limit of the Ford plane's capacity for work. *The first one has yet to wear out.*

THE STOUT METAL AIRPLANE COMPANY  
Division of Ford Motor Company  
Dearborn, Michigan

*The Ford Tri-Motored All-Metal Transport will be on display at the All-American Aircraft Show.*

Volume 14  
No. 4

AERO DIGEST

APRIL  
1929

THE MAGAZINE OF THE AIR

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Contributing Editors: Dr. Michael Watter, Cy Caldwell, Don Rose, Edgar H. Felix.

BRANCH OFFICES:

BOSTON: 80 Boylston Street. Henry C. Pragoff, Representative. Phone: Hancock 8915 & 8936.  
CHICAGO: 720 Cass Street. L. F. McClure, Representative. Phone: Superior 2802.  
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The route of the Northwest Airways is one of rare beauty. One of the Hamilton eight passenger planes in flight between Minneapolis-St. Paul and Chicago.

# A MILLION MILES OF SAFE AIRLINE OPERATION

THREE short years ago advocates of the establishment of airlines for the carrying of mail, passengers and express found but a few attentive ears. Interest often lagged when the subject of investing thousands of dollars in an airline venture was broached. There were performance figures available showing that air mail operations had been carried on successfully for several years. The Government, however, through the Post Office Department, had financed these operations. The average business man felt that there was a vast difference in favor of Government operation as against operations carried on by private companies.

There were a few individuals, however, who were willing to take the financial risk at that time. The performance record of airlines in the past two or three years has more than justified the confidence placed in them by their organizers. Since then a number of airlines have been organized and have been operating successfully.

Northwest Airways, Inc., is a typical one of the airlines that has "gone through" in true air mail style for a period of nearly three years. It was in June, 1926, that the first plane of the Northwest Airways took off on the Chicago-Twin Cities run. No passenger service was offered until midsummer of 1927. Prior to that time the new airway carried only mail and express between Minneapolis-St. Paul and Chicago by way of LaCrosse, Madison and Milwaukee. Since the line had operated under the most adverse and cold weather conditions for eight months without the loss of a single piece of mail and without an accident, it was decided to begin a passenger service on the regular mail schedule. Since that time, the planes of this line have covered over a million miles and have maintained an efficiency record of 94 per cent for going through on time. People who live along the route have been known to set their watches by the mail planes. Safety? The records of the company show that there has not been an accident of any kind. There have been no injuries to pilots or passengers; the pilots have never lost a bit of mail and have never "washed out" a plane.

Considering the extremely unfavorable conditions encountered during the winter months in that part of the country, the records established serve to indicate the reliability of airplanes for this type of transportation service.

The development of the Northwest Airways, Inc., has been steady and progressive. It is the first airline to have begun coordinated air and rail service on regular schedule. Last September a link was made with the Northern Pacific, the Great Northern, and the Chicago, Milwaukee, St. Paul and Pacific railways. The Pennsylvania System,

By  
**Martin P. Kelly**  
*Traffic Manager, Northwest Airways*

the Baltimore and Ohio and the New York Central lines have since joined in an air-rail tie-up with the line. There are two types of service offered on the Chicago-Twin Cities route. One is called the Air-Rail

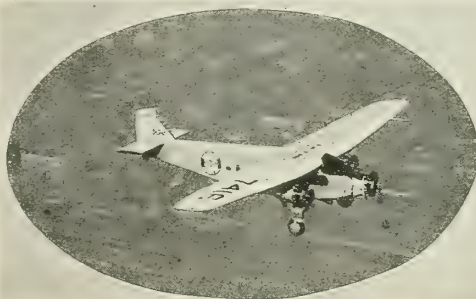
Service—the other, the Air Mail Passenger Service. The Air-Rail Service which was started last September is a non-stop run of a little over three hours between the terminals. The Air Mail Passenger Service makes intermediate stops at LaCrosse, Madison and Milwaukee. There is also a feeder line operating between Green Bay and Milwaukee. The trimotored Ford monoplanes used on the Air-Rail Service have a capacity of fourteen passengers and crew. The three Pratt and Whitney 410 horsepower Wasp engines give these planes a top speed of 135 to 140 miles per hour and a cruising speed of 115 miles per hour. The cabins are roomy and are equipped with comfortable, upholstered seats. In the rear of each cabin is a separate compartment for those who wish to smoke. In addition to the space provided for passengers, there is plenty of room for baggage and express. The planes leave daily from Twin Cities after the arrival of the fast trains from the Pacific Coast. Passengers are flown to Chicago in three hours,—in time to catch the fast eastbound trains leaving just after noon. In traveling westward, passengers are picked up at Chicago and flown to Twin Cities in time to catch the fast trains bound for the Pacific Coast. A whole day in the transcontinental trip is saved by travelers using this service.

Hamilton all-metal Wasp-powered cabin planes are used for the Air Mail Passenger Service. Leaving Minneapolis at 2:30 p.m., or St. Paul at 2:40 p.m., the plane makes its first stop at LaCrosse at 4:00 o'clock; the second at Madison at 5:30; the third at Milwaukee at 6:35, and arrives at Cicero Airport, Chicago, at 7:30 p.m.

The ticket entitles its holder to transportation between the airports and railroad terminals. Special de luxe busses operated by the company carry passengers and baggage. Each passenger is protected for the flight by a \$20,000 liability insurance policy. The planes carry air mail, leave exactly on schedule, and make the trip every day whether there are passengers or not.

The luxuriously furnished planes provide adequate travelling comfort. Passengers can watch the scenery, read or doze as they please in comfortable chairs. A uniformed steward is in attendance. He serves light refreshments en route and looks after passengers' comfort in general. The route of the plane high above the waters of the Mississippi and over the rolling farm lands of southern Wisconsin and northern Illinois is a trip of rare beauty. The well-marked route followed and the many landing fields scattered between the

(Continued on page 286)



The Northwest Airways Ford over Minneapolis



# ENDURANCE FLIGHTS

By H. B. Henrichson

*Assistant Physicist, Aeronautic Instruments Section  
National Bureau of Standards*

**D**URING the year 1928, many endurance flights, military as well as civil, have been made. In the past, men always have been the pilots on such attempts, but now women too are entering this gruelling field of endeavor. Several of these flights met with success in establishing new world records, while others, unfortunately, fell short of the treasured mark. During an eventful year, the official world's record for duration changed hands four times, having been held first by Germany, next by the United States, then by Italy, and finally by Germany. At the present writing, the world's endurance record of 65 hours and 25 minutes without refueling is held by the famous pilots Risztics and Zimmerman of Germany.

The first duration flights of the year were made by Clarence Chamberlin, transatlantic pilot, with Roger Q. Williams as co-pilot. Both of these men deserve special credit for their determination, pluck, and cheerfulness, even in the face of repeated failures. A first duration attempt was made on January 11th at Roosevelt Field, Long Island, New York. The take-off was successful, but due to the failure of the fuel pump, a forced landing was necessary after the ship had remained in the air for only about four hours.

On the next day, January 12th, Chamberlin and Williams again successfully ascended from Roosevelt Field in a Belanca monoplane, powered with a new Wright Whirlwind motor of 220 horsepower. The plane, named for its owner, A. R. Martine, carried aloft at the start about 480 gallons of gas. During the first evening of the flight, a leak developed. The leak which developed in the left wing tank caused a considerable loss of gasoline. In spite of the gas which was lost, the ship remained in the air 51 hours, 52 minutes, and 24 seconds. Had it not been for the unfortunate two-inch crack in the wing tank, they would have broken by a considerable margin the existing official record of 52 hours, 22 minutes, and 31 seconds held by Risztics and Edvard of Germany. In order to establish a new

world's endurance record, it is necessary, according to the rules of the Federation Aeronautique Internationale, to raise the previous record by at least one hour. This gruelling flight, nevertheless, exceeded the American duration record made in the spring of 1927, by Chamberlin and Acosta.

At the close of an endurance flight, the sealed barograph is removed from the plane by an official observer who represents the National Aeronautic Association. The instrument is then sent to the Bureau of Standards in Washington, D. C., where, in the presence of a member of the contest committee of the N.A.A., the lead seal is broken. The trace on the smoked chart then is examined for intermediate landings which might have been made by the ship. The smoked chart record, after being fixed by dipping into a solution of collodion in Duco solvent, is replaced on the drum. Next, the clockwork is started, and the flight time interval as given by the duration trace is carefully checked against a standard time piece. This determination, of course, is merely a further check on the duration time already accurately observed by the N.A.A.

official who times the start and finish of the flight to the second, using a high grade stop watch which has been certified by the U. S. Naval Observatory.

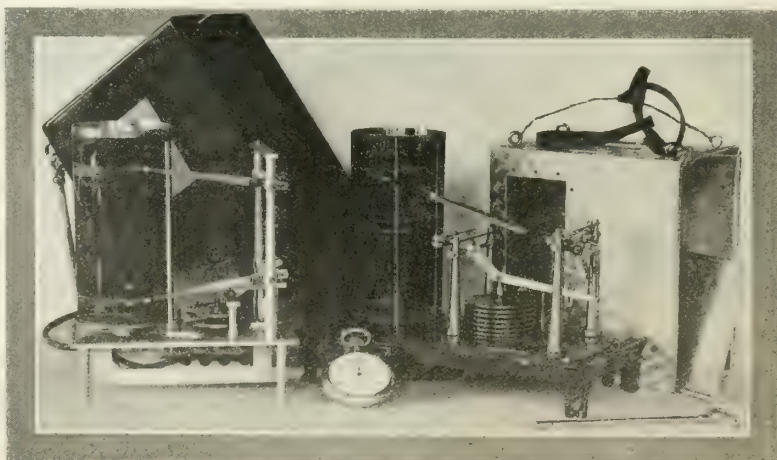
With only a day of rest, Chamberlin and Williams again took the air on January 16th, not satisfied until they had captured the duration record. Using the same plane, a good start again was made from Roosevelt Field. On this occasion, they ran into a 15-minute sleet storm which quickly loaded the ship with ice. In addition, it also seriously altered the contour of the wing, the proper curva-

ture of which is of such vital importance in securing lift for the plane. As a result, the ship was grounded after remaining aloft for only 3 hours. These pilots, nevertheless, will always be remembered for their perseverance, grit, and good cheer even in the face of much misfortune and many physical hardships.

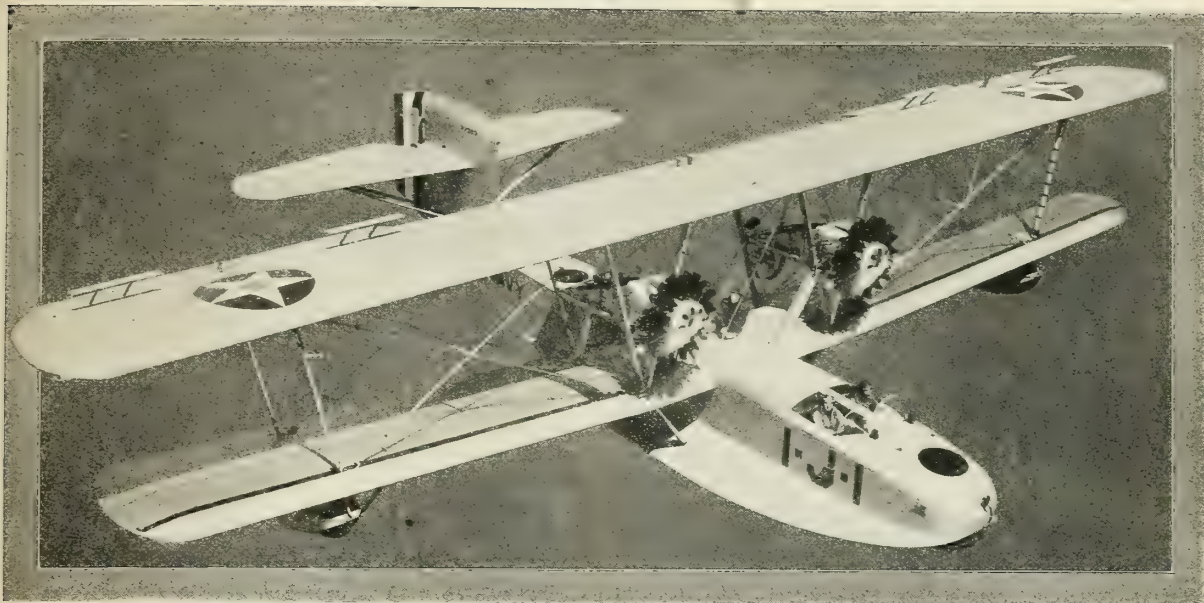
On January 17th, after several



Mr. Henrichson examining the trace on the smoked chart of an endurance barograph.



Instruments used for recording and verifying endurance flights.



The Navy PN-12 which has established several notable endurance records.

previous unsuccessful efforts, Capt. Charles Kingsford-Smith, an Australian aviator, and Lieut. George Pond, U. S. N., took off at San Francisco in the *Spirit of California*, a trimotored Fokker monoplane, powered with Wright Whirlwind engines. They carried about 1,530 gallons of fuel at the start of the flight and landed out-of-gas on January 19th, after remaining in the air 50 hours and 7 minutes. On a former attempt they remained aloft 48 hours and 27 minutes. Because of mechanical troubles, several earlier attempts were of much shorter duration. All these trials, however, were considered preliminary, made only in preparation for the sensational flight of the *Southern Cross* from California to New Zealand by way of Hawaii.

On February 7th, in solo flight, Bert Hinkler, a British pilot, took off from Croydon Aerodrome, in London, in an Avro Avian light landplane powered with a Cirrus motor of 80 horsepower. He headed for Rome, which happened to be the first stop on a long distance flight to Australia. The duration time for the first leg of the journey was 13 hours, establishing an unofficial record for a light plane. For the notable flight from England to Australia, Bert Hinkler, the Lindbergh of Great Britain, has recently been awarded the Federation Aeronautique Internationale gold medal given for the most meritorious flight during the year 1928.

On February 21st, in solo flight, the late Harry Brooks, took off from Detroit, Mich., in a light Ford monoplane powered with a Ford type AC motor of 36 horsepower. He landed 13 hours and 40 minutes later at Titusville, Fla., establishing an official distance record for a light plane. His duration time in this flight exceeded that of Bert Hinkler by 40 minutes.

On March 28th, George Haldeman and Eddie Stinson made a successful take-off at Jacksonville Beach, Fla., in a Stinson-Detroit monoplane powered with a Wright Whirlwind motor of 220 horsepower. They were out to

break the world's duration record, then still held by the Germans. Starting with 500 gallons of gas, they took off over the sea, circling the coast over a 30-mile area at an altitude that varied from 800 to 1,200 feet. Ideal weather conditions, fortunately, were experienced during the entire flight. An out-of-gas landing was made on March 30th, which established a new official world's endurance record of 53 hours, 36 minutes, and 30 seconds. This bettered the German record by 74 minutes. In addition to the honors of a world's record, Haldeman and Stinson won a cash prize of \$5,000 offered by the Jacksonville Junior Chamber of Commerce. It was indeed a

splendid victory both for the pilots and for the ship. For the ship especially, for in aviation circles it was generally considered that other planes had better prospects in duration flights.

On May 2nd, in solo flight, the late Lieut. Royal V. Thomas took off from Roosevelt Field, New York, in the Bellanca monoplane, *Reliance*, powered with a Wright Whirlwind motor of 220 horsepower. On this particular flight, I had the good fortune to serve as official observer for the National Aeronautic Association. Since the preparation for this flight was made in secrecy, it has had but little publicity.

Arriving at Pennsylvania Station, New York, at 1:00 a. m. the author was met by Jackson Martindell, backer of the flight. Leaving at once in his car, we headed for Roosevelt Field and arrived there several hours before sunrise. At the first indication of day, a Socony gasoline truck arrived to fuel the plane. Just as the sun rolled up on the horizon, the monoplane was wheeled out of its hangar, tuned up, and taxied across the field to the famous transatlantic runway on Roosevelt Field. Here the ship, in reality a flying gas tank, was fuelled. The dump valves were tested several times by the pilot who was the most incessant worker about the



Refueling the "Question Mark" in flight.

(Continued on page 266)



# WHERE THE SUNSHINE SPENDS THE WINTER

WHEN I was a kid—this was 'way back in the early hoop-skirt period, when none of us men-folk even suspected that women had legs, let alone knees (and I do think that civilization has progressed since those days)—when I was a bit of a boy, then, I used to live with my folks on a farm in Northern Saskatchewan. And long about the end of fall, after Pop had threshed his wheat and oats and had learned just how much he had lost on that year's farming, why, he and I used to take our guns and go to a pond on our place to shoot geese. That's what we used to go for, and we did do quite a lot of firing, and I guess we scared the daylight out of those geese. Or perhaps we merely amused them; I don't know. But they'd honk sort of derisively and sail away from there without casualties. You see, Pop had been looking for profits in farming for so long that he'd lost his eyesight; and I was cross-eyed as a kid anyhow, so the pair of us were hardly what you'd term a menace to a goose. Any goose that was at all thoughtful, that is. And a goose is a mighty thoughtful and wary bird. Soon as it gets at all cold, why, the old goose gives a honk of disgust and flies off to the sunny South.

Well, as a kid I took note of that fact; and one day, just after we'd missed a big gander, I said to Pop, "Pop, I guess you reckon as how us, being humans, or near it, anyhow, are a tarnation sight smarter than them geese, don't you?" (This was before I got my Harvard accent through raking up the leaves on the campus.) "But Pop," I says, "them geese ain't dumb enough to spend a winter in Saskatchewan, are they?" "Now you come to mention it," says Pop, "they ain't. And they ain't none of 'em married, either. I reckon as how they're right smart birds, at that." "Well," I says, "when I grow up I aim not to spend no winters in no place where the water gets so you can walk on it without the benefit of a miracle. I aim to follow them birds down south, and just sort of lay around in the sunshine, and eat and fish, and sort of lazy 'round." "Let me know when you get your first million," says Pop, "and I'll come down and eat with you."

Well, that was a many years ago, folks, and although I never forgot that talk, or what I thought in those days about the birds being smarter than we, it has taken me more years than I care to admit before I reached a state where I was at last as smart as a goose. Or almost as smart, I should say. For even now I can't seem able to spend the whole winter at Miami Beach—where half the girls are working girls, and the other half are working men. But I *have* got to the state where once each winter my arduous labor as a pilot takes me to the South. And I'm going to tell you about my trip there so you folks will understand that you've got less than nothing on an old Canada goose.

And I haven't got much more on him than you have, for as I write this in March, I am back in my apartment on the shores of Lake Erie, in an overgrown small town called Cleveland. And Cleveland is cowering down under the worst blizzard of the winter; old Lake Erie, that I can see from my windows, is whipped by a sixty-mile-an-hour gale into ocean-like waves; the bare trees are bowing and bending in the wind, and the snow is pattering against the window panes. It's just a hell of a day, and I wish I was back in Miami. But cheer up! Tomorrow I shall be

By

*by Caldwell*

on my way to sunny Texas; and when you read this it will be April, and you will be getting thawed out. So both of us will be all right. But the bimbo who wrote, "I don't mind the grey skies, Sonny Boy,"—he lived down South. I *do* mind the grey skies, and so does everybody else, including air mail pilots.

The geese had been down South for quite some time, and had got all nicely tanned and used to the hotel prices long before I even started. For it wasn't until nearly the middle of February when I was called in and told to start south by Mr. Tom Aspell, Commodore of the B. F. Goodrich Company's Air Fleet—which at this date consists of one folding waffle-iron of the air, known to the trade as the Fairchild FC-2. That's a great little plane, a fine little cruising ship, but kind of tame. The Wasp job is something really excellent and is what I'd like. But in these days of Prohibition we have to take what we can get. However, this FC-2 is a fine ship.

My passengers from Akron were Mr. L. A. McQueen of the B. F. Goodrich Co. and Mr. J. I. Rowell of the Cleveland Trust Co. A most peculiar man, this Rowell. He suffers from a complaint prevalent among country newspapers—poor circulation. He's the coldest man I ever carried, and I've chilled as many passengers as the next one. But this lad got cold and stayed cold all the way; and when we landed for the night at Atlanta and got to the hotel he spent the balance of the evening sitting on the radiator. I promptly christened him "Aunt Mary," after an old maid aunt of mine who suffered from the same complaint.

Mr. McQueen is a perfectly normal man—and my friends tell me I'm sub-normal, so you see we had perfect balance in the ship. What I like is a well-balanced crew on a trip like that. And of course you should carry liquid ballast, as all good ships do, so you can pump it from one side to the other in case a bump puts the ship out of trim. We had that all looked after, of course, and got along famously.

Nature was merciful to us right from the start. Jack Berry's frog-pond sometimes known as the Cleveland Airport, was wrapped in frost and covered with eight inches of snow, which providentially kept us out of the mud. I don't know why Jack doesn't cover that swamp with ashes—he's manufactured enough in that pipe of his during the last five years to make two runways. But Jack stated five years ago that he doesn't believe in runways—even when nothing better is feasible—so the city took him at his word and won't vote money for any. Which leaves Jack in the peculiar position of having to grow grass on clay—and that can't be done, though Jack maintains that it can be. Jack, you'll grow grass on that field on the same day that a bald-headed man grows a new crop of hair. Who do you think you are, anyhow?—the Seven Sutherland Sisters, or old man Herculicide?

Say, that run from Cleveland to Cincinnati is a great help to poor navigators who don't know the exact difference between a sextant and a sexton—and in case you don't know either I'll tell you: A sextant shows you where to go when the sun is up, while a sexton shows them where to put you when your sun has gone down. But on that run to Cinncy, you don't need anything but patience, for the Big Four have thoughtfully laid their tracks for you to follow. And did it ever occur to you that if the railroads ever removed their tracks how few of us would

(Continued on page 260)





Pan American Airways' terminal at Miami.

# RAILROADING THE AIRLINES

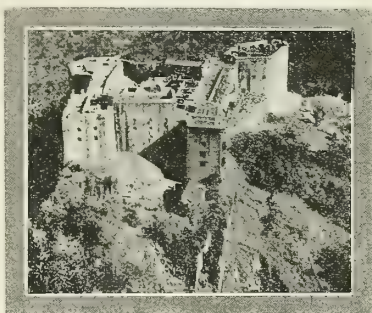
THE development of transportation facilities and communication methods to their utmost efficiency is the keystone in the arch of America's supremacy in the world today. Our railroad pioneering of the past three-quarters of a century has surpassed—in the difficulties overcome, extent of development, ultimate luxury of accommodation and comparative safety of operation—any like enterprise in any country of the world, so it is only natural that tumbling headlong into aerial transportation after eight years of heart-breaking quiescence, we should build our network of airways on the foundation of our railroad experience and operate them with the same general methods of procedure that three-quarters of a century have taught us.

Already transport flying has taken on the semblance of all that is implied by our strictly American word "railroading." Both starting, as they did, as adventurous pursuits and settling gradually into a confraternity of endeavor the goal of which is to "get the traffic through," it is natural that they should operate along the same general lines and attract to their service the same hard-bitten men, with a unity of purpose that appalls the man in the street and a sense of humor found only in men who solve continual problems and lick the impossible in open fight.

So alike in purpose and problems are airlines and railroads today that we see them operating in conjunction—

By

James Warner Bellah



Citadelle of the Emperor Christophe,  
a place of unusual interest in Haiti.

train to plane and plane to train—and to a certain extent in method.

Successful operation today does not lie alone in selling air transport to ground travellers on the basis of time-saving, cleanliness and equal safety as it did three years ago, for today there exists a regular air travelling public, initiated into the one-time mysterious thrill of flying, and finding it within rational limitations a far preferable mode of travel than any other. Success lies rather in selling your particular service in open competition with other services, as the railroads and steamship companies do. Efficiency of operation (and its resultant profit) lies in utilizing your facilities to their utmost, thereby cutting the expense of overhead on a temporarily inactive plant. To do this, infinite pains must

be taken to approach and sell every class of passenger on the same basis the other modes of transportation sell him.

In the West Indies, for instance, from which I have just come, Pan American Airways is finding an all-year passenger demand in the representative of American companies who occupies a travelling, buying, selling or inspecting job between Cuba, Porto Rico, Haiti and Santo Domingo. This man exists all over the world and offers his special problem to transportation companies. He travels the same route at regular intervals and he's a repeating customer. In the Indies he has been accustomed to ten or fifteen-day idling waits between ports. (Continued on page 286)



An aerial view of the new Miami airport of Pan American Airways



# AMERICA'S PART IN AUSTRALIAN AVIATION

**A** MERICAN aeronautical influence has placed its hallmark within the last twelve months on that exceptionally air-minded country—Australia. The importance of this fact lies in two corollaries: the tremendous advances being made in the aviation industry in the United States, and the unique capacity of Australia to absorb new methods and equipment for commerce and communication by air. Outside of the Western Hemisphere, therefore, America's greatest aviation opportunities now lie in the land of the Southern Cross.

How Australia came to feel the quickening touch of American aeronautical development is an interesting chapter in the history of the industry—a chapter that can be best understood, perhaps, in the light of the amazing progress of Australian aviation itself.

Sir Alan Cobham, upon the completion of his famous flight from England to Australia and back, in 1926, seemed entranced at a remarkable discovery—he found the ideal land for wings: no fogs or snows or frequent heavy rains, thousands of miles of natural landing facilities, absence of large mountain ranges, and a population so widely distributed over a large continent that it could best be served by air.

Yet Australians had realized all this for a long time. As early as 1878, Lawrence Hargrave, an Australian, gifted with the prophetic vision of human flight, had begun his aeronautic studies. Both Wilbur Wright in 1900 and Santos-Dumont, who in 1906 made a first European flight, acknowledged their debt to this Australian pioneer. Australians joined in the general enthusiasm of those first flight years, 1903-1909, especially since they felt that successful airplanes were based somewhat on Australian discoveries. An aerial league, N. S. W., was formed, and, incidentally, its present descendant, N. S. W. section, Australian Aero Club, sent its president, Capt. C. F. Hughes, as one of the two official Commonwealth representatives to the International Civil Aeronautics Conference in Washington in December last.

First flights in Australia were made by G. A. Taylor, who conducted a series of successful glider tests in 1909, and J. H. Duigan, who constructed and flew a powered machine in 1910. Sir Harry Hawker now entered upon

By  
A. D. Rothman

the scene, and his work and that of the Australian Flying Corps during the war stand out among the distinguished accomplishments of aviation.

Sir Harry's solo Atlantic flight in 1919, the flights of Sir Ross and Sir Keith Smith and Lieuts. R. J. Parer and J. C. McIntosh from England to Australia in 1919 and 1920 for the Commonwealth Government £10,000 prize; the Australian peripheral flights of 1924 by Wing Commander S. J. Goble and Flight Lieut. I. E. McIntyre, Lieut. Col. H. C. Brinsmead, Controller of Civil Aviation and head of the official Australian delegation to the aeronautical conference at Washington; the Australia-Pacific Islands flights of 1926 by Captain Richard Williams;

and the San Francisco to Sydney and Sydney to New Zealand and return flights of Capt. Charles Kingsford-Smith and Lieut. C. P. Ulm in the *Southern Cross*; the trans-arctic flight of Capt. Sir Hubert Wilkins and the tour by air from England to Australia by Bert Hinkler, in the present year, are among the outstanding aerial feats by Australians.

Civil aviation in Australia made a first important step forward with the establishment in 1920 of a Federal department for its control, under the direction of Lieut. Col. Brinsmead, and the inauguration in 1920 of the initial aerial service for mail, passengers and freight between Derby and Geraldton, Western Australia, a distance of 1,200 miles. In seven years, the growth of this new system of transport has been tremendous. Of the world's 70,000 miles of regularly operated air routes, Australia, with four-thousandths



Melbourne, the Capital of Victoria, South East Australia



The Fairey D.3 in which Goble and McIntyre flew around Australia



of the world's population, owns 5,800 miles or approximately one-twelfth. With one-twentieth the population of the United States, Australia nevertheless possesses more than one-third as much air route mileage and approximately one-eighth as many airports; and in 1928 the mileage flown in the Commonwealth is more than one-fifth that flown in the United States. Moreover, there is in Australia under one operation probably the longest single aerial highway in the world,—that from Adelaide in South Australia to Derby in Western Australia, approximately 3,000 miles.

The contemplated Australian expansion of national and international air routes is one of the most ambitious of the present day, involving a mileage of 25,720 and including trans-oceanic routes to Tasmania, to New Guinea, to New Zealand, to London and to Canada and the United States. The government has indicated that, with the exception of the last four, regular passenger, mail and goods carriage aerial service will be begun within the next two years. The contemplated airship service between London and Australia, via India, may take six years to establish; the New Zealand and New Guinea services depend upon the immediate initiative of private interests; while the American service will probably require a decade or more of development in aviation before it can be accomplished.

As concerns military aviation, the Commonwealth government has just approved a capital expenditure of £1,990,500 for equipment, works and personnel, and extra annual appropriations of £1,139,800. Regular aerial defence appropriations had totaled £273,032 in the financial year 1922-23, and had risen to £595,027 in 1926-27.

In the direction of equipment manufacture, Australia has moved forward in the present year. A factory for mass production of an all-metal monoplane will begin operations shortly, and it is expected that the first ship will be ready in April or May and at least one complete plane per week

will be turned out thereafter. Moreover, Captain Kingsford-Smith has announced within the last six months that he and Lieut. Ulm, in association with private interests, will soon begin the manufacture of airplanes in Australia.

What part has America played in Australian aviation hitherto? Until two or three years ago, next to nothing. British practices and development virtually dominated the Australian field. Today, however, America has penetrated the Southern Hemisphere, and Australians have begun to

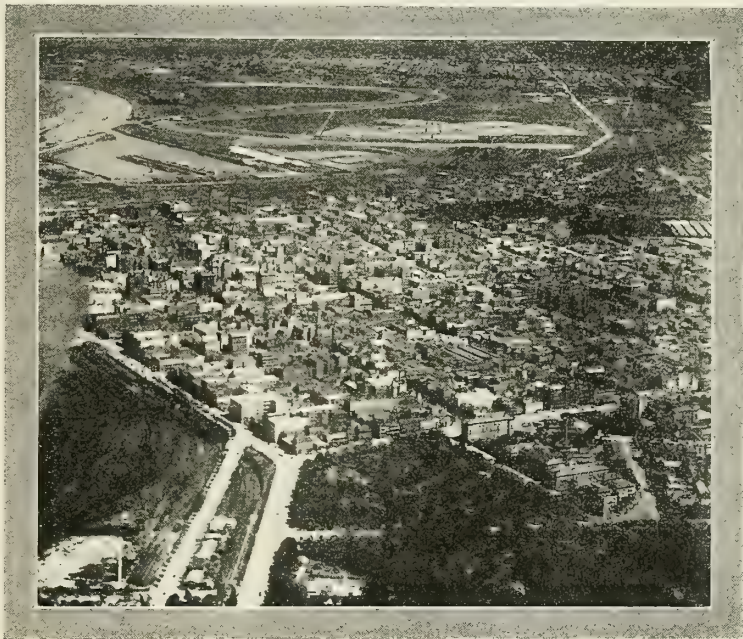
look to their great neighbor on the Pacific for direction and materials in aeronautics. The change has been a significant one.

Until after the war, the United States was, of course, not entirely in the vanguard of aviation. Actually, it was not until 1926 that America began to make its phenomenal advance forward. President Coolidge in his address before the International Civil Aeronautics Conference on December 12 last said: "Then (1926) the value of the aeronautic industry in the United States was placed at

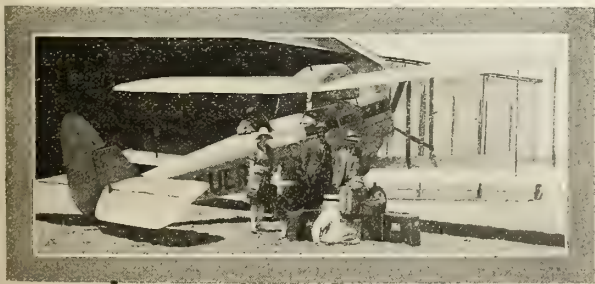
less than \$5,000,000. Today it is said to be in excess of \$150,000,000."

The International Aerial Navigation Conference at Paris in 1919 had seriously limited America's aeronautical influence abroad. Under the convention of October 13 of that year, the signatory nations undertook to prohibit the importation of aircraft unaccompanied by a certificate of airworthiness issued or endorsed by a state which was a party thereto. The United States had not signified assent to the Convention and has since been working under a distinct handicap. It may be that, even before this article is published, the "diplomatic conversations" initiated by the American Government with the foreign representatives to the Washington aeronautical conference, immediately after its three-day session on December 17 last, will result in a new agreement to supersede the 1919 arrangements. But of that, later.

Although Australia delayed for a long time the proclamation of the import prohibition against the United States, the 1919 convention was probably the greatest single force militating against American entry on the Australian aviation scene on an important commercial basis. Nevertheless, under an arrangement whereby aircraft of non-signatory nations to the Paris convention could be admitted into Australia if certified airworthy by a signatory nation, the embargo did not wholly exclude American machines from the Commonwealth. British machines and British practices, however, were the dominating force. Even as recently as last November, Lieut. Ulm, in explaining plans for a Melbourne-Brisbane commercial service, pointed out that the first machine used on the route would have to be British-



Melbourne, the Capital of Victoria, South East Australia



A DH 50 on arrival at Longreach from Charleville



made, although of the same design as the *Southern Cross*—which is American-built. The difficulty of obtaining registration of an American-made airplane in Australia rendered it impractical to have other than British machines for the new venture.

The spontaneity of American aviation developments in the last two or three years, however, was too great to be overlooked in any part of the world—and in Australia it made a profound popular impression. The conquest of the seven seas by American fliers such as Byrd, Lindbergh, Chamberlain, Brock and Schlee, the unique performance of American-made planes in such Australian-American ventures as the

San Francisco to Sydney and trans-Arctic flights aroused feeling in the Commonwealth for a closer rapprochement with American aviation interests. For a period of three years, the American office of the Australian Commonwealth Government, keenly aware of the growing importance of American aeronautical enterprise, literally bombarded the Prime Minister's Department with everything being published on American flying, and ultimately made the direct recommendation that an Australian aviation engineer be sent for a several months' study of American conditions. The action of Japan and other foreign nations in sending such technical experts and the cordiality with which the American aviation industry had received them was instanced as indicative of the wisdom of such a step.

Overnight the question of comparative values of American and British equipment became controversial in Australia. The newspapers opened up their columns to both opinions, and leading articles on the subject of "American influence" became not infrequent. The discussion became especially active when Capt. Frank Hurley, the noted Australian explorer, announced he would use an American airplane for a flight to England; the New South Wales Airways, Ltd., began negotiations with the Federal government for the establishment of a Canberra-Sydney service employing the Ryan monoplane; and the American invitation to Australia to participate in the Washington aeronautical conference was received.

Captain Hurley declared that he had been compelled to go to the United States for an airplane. When he had asked a British firm for a plane with a cruising radius of 2,000 miles, he said he was laughed at. The best that could be offered in Britain was a ship costing £8,000, with a range of only 900 miles. He pointed out that the *Spirit*

of Australia in which he intended to fly to England was built on the same model as the *Spirit of St. Louis* in which Col. Lindbergh had flown to Paris, had a cruising range of 2,000 miles, and cost only £3,700.

Sir Keith Smith came out strongly against the use of foreign machines in Australia. It was nonsense, he said, to suggest that British manufacturers could not supply the requisite equipment for such undertakings.

The invitation to the Washington conference was received with a great deal of interest, but several months elapsed before the government would announce a decision. The newspapers began to ask the reasons for delay. It was "a deplorable omission." The conference promised to have "far-reaching results." "If our (Australia's) isolated position makes special calls on our vigilance lest we lose touch with the latest developments in mechanical things, how much more alertness is necessary in the case of aviation which scraps this month what was invented last month." "It is unfortunate that this country, whose need to keep abreast of the latest development in aviation is so vital, should let slip this opportunity."

In the meantime, Major Norman Brearley, managing director of Western Australia Airways, Ltd., operator of the great Derby-Perth-Adelaide air service, had come to the United States to study aviation developments for his company. He informed the writer as follows:

He was impressed with the extraordinary development of airplane manufacture in America, the ease and reasonableness with which complete machines or accessories might be purchased as readily as automobiles. He had inspected and tested almost every type of machine in America, and had selected the machines and parts for use in Australia. He had made a thorough investigation of air mail services and night flying in the United States, which was to be introduced on the Perth-Adelaide service. He strongly emphasized the importance to Australia of representation at the Washington aeronautical conference, which he be-

lieved, would widely influence the progress of Australian aviation for the next two or three years, in view of the potentially excellent market there for airplanes designed for personal and commercial use. He believed that a high degree of safety in aircraft had been reached in the United States, and the few exceptions would be readily overcome.

On November 7, the government finally announced acceptance of the invitation and the appointment of Lieut. Col.

(Continued on page 284)

#### GROWTH OF CIVIL AVIATION ACTIVITIES IN AUSTRALIA

Year	Number of Flights	Number of Hours Flown	Number of Miles Flown	Number of Letters Carried	Number of Passengers Carried	Freight Carried (pounds)
1923.....	4,727	3,271	244,111	118,810	4,989	11,817
1924.....	4,354	3,703	269,909	174,641	4,761	8,456
1925.....	4,893	5,302	404,420	225,128	6,091	11,132
1926.....	5,838	6,426	487,603	272,707	7,004	62,873
1927.....	17,284	10,447	772,643	290,746	17,206	125,924
1928.....	73,900	20,200	1,494,200	301,554	43,830	160,800

#### AUSTRALIAN AIRLINES NOW IN OPERATION

Route	Distance
Adelaide-Perth-Derby <sup>1</sup> .....	3,000 miles
Adelaide-Broken Hill-Melbourne-Sydney <sup>2</sup> .....	1,200 miles
Brisbane-Camooowal <sup>3</sup> .....	1,200 miles
Camooowal-Daly Waters <sup>4</sup> .....	400 miles
Total .....	5,800 miles

<sup>1</sup>Operated by Western Australia Airways, Ltd.; Annual Government Subsidy (approx.) £60,000.

<sup>2</sup>Larking Aircraft Supply Co.; Subsidy £30,000.

<sup>3</sup>Queensland & Northern Territory Aerial Service, Ltd.; Subsidy £25,000.

<sup>4</sup>Larkin Aircraft Supply Co.; Subsidy £8,000.

#### PROPOSED AUSTRALIAN AIRLINES

Route	Distance
Derby to Port Darwin .....	800 miles
Port Darwin to Daly Waters .....	400 miles
Normanton to Gloncurry .....	220 miles
Broken Hill to Charleville .....	500 miles
Canberra to Melbourne and Sydney .....	500 miles
Wyndham or Port Darwin to London .....	10,000 miles
Sydney to Brisbane .....	550 miles
Sydney to New Zealand .....	1,500 miles
Melbourne to Tasmania .....	250 miles
Brisbane to New Guinea .....	2,000 miles
Brisbane to Canada and United States .....	9,000 miles
Total .....	25,720 miles

# GLIDING IS REVIVED IN AMERICA

By F. M. BLUNK, *Test Pilot, Gliders, Inc.*

**R**APID progress in the gliding movement is being made in the vicinity of Detroit following the development of a successful training ship by Gliders, Inc., a manufacturing organization headed by William J. Scripps and a group of Michigan pioneers in the promotion of motorless aviation. As a result of the numerous flights made over the Lake Orion hills by planes from the nearby glider plant, several enthusiastic glider flying groups have been formed and will soon begin preliminary training under direction of Oscar Kuhn, of Germany, a graduate of the Rossitten school, and the writer.

Mr. Scripps has been interested in the formation of the flying clubs and has had the assistance and coöperation of J. C. Penny, Jr., president of the American Motorless Aviation Club. Mr. Penny was sponsor of the German delegation of Captain Paul Roehre, Peter Hesselbach and Paul Laubenthal, that carried on a series of soaring flights and conducted a training school last summer on Cape Cod. Messrs. Scripps and Penney plan to resume operations on Cape Cod this year with Captain Roehre in charge.

The training glider produced by Gliders, Inc., was the result of several months of careful study. The first plane out of the shop was a flying success, but Mr. Scripps and his technical advisers made a number of improvements in the plane that finally was passed as being up to the desired standards of glider construction. After test flights, the plane was turned over to the glider section of the Aeronautical Society of the University of Michigan.

The University group held the first public demonstration in Michigan at Ann Arbor January 27. Despite zero weather, more than 2,000 persons attended the demonstration. Flights were made by Dr. Wolfgang Klemperer, member of the technical staff of the Goodyear-Zeppelin Corp., who was the first registered glider pilot of the Rhoen-Rossitten Society in Germany; Mr. Kuhn; and several students, including Robert B. Evans, chairman of the University glider section.

Prominent airmen including William B. Stout, president of Stout Air Services, Inc.; Edward S. Evans, president of the National Glider Association, and F. P. Pawlowski,



Mr. Blunk testing a University of Michigan glider.

U. of M. professor of aeronautics, witnessed the gliding at Ann Arbor. All were enthusiastic with the performances made and the public interest manifested by the crowd.

Safety was the paramount factor in building of Gliders, Inc., craft. Because of its strength and durability, the single longeron fuselage idea was followed, and in wing construction, too, every condition known to gliding was taken into consideration. The result is a glider difficult to wash out under normal conditions, and an air performance second to none. In test flights made under varying atmospheric conditions, and from elevations up to 100 feet it proved a superb craft. Its static gliding angle is 1:10. Sitka spruce is used in all members with birch plywood coverings. The span is 34 feet, chord 5 feet, weight 220 pounds, length overall 16 feet 6 inches, height from skid to cabane tip, 8 feet.

Although Gliders, Inc., has designs for circling and soaring ships, no attempt will be made at present to place these types in production. The present craft is suitable to carry students through the "A" test, and through "B" test in proper conditions of terrain and weather. Under the gliding rules of the International Federation Aeronautique, "A" test requires a start from an elevation of 90 feet and a straight-away glide to a mark of 1,000 feet distant and duration of at least 30 seconds. "B" test involves the first stages of soaring. It requires a flight of at least one minute's duration and the completion of an S-turn.

The Germans have adopted three types of gliders for construction and sport purposes. The first is known as an elementary glider. It is a machine with low aspect ratio, rather heavy, built very sturdy, so that the beginner, if he crashes from a height of a few feet, won't break up his machine. They are not intended for soaring at all. In a very stiff wind they could soar, but the beginner is not supposed to soar. His instructions are to stay close to the ground and learn his controls. A glider of this type has no fuselage in the ordinary sense of the word. The pilot sits on a little framework in front, with the controls in front of him, and he is strapped in. He has perfect vision in all directions.

The next advanced type is called a circular or intermediate ship. That ship is a little more efficient than the elementary ship, but still is not a soarer except under unusual conditions, with a very stiff upward breeze; but they are supposed to be able to circle and come back to



About to take off on a glider.

(Continued on page 284)



# COMPETING WITH SUNSHINE

The Origin and Development of Night Photography in the Army Air Corps

By H. F. Wilkins

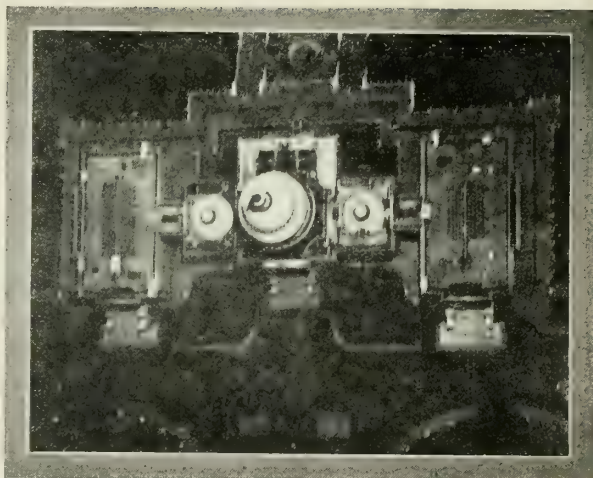
A SERIES of important experiments in night photography was begun nearly four years ago at the United States Army Engineering Division experimental plant at Dayton, Ohio, and over the city of Rochester, New York. The significance of the invention that made it possible, the months of ingenious laboratory work that preceded it, and the nights of hazardous experimenting with high explosives in Army airplanes, constitute an unparalleled story of scientific adventuring.

On several occasions in 1925 and early in 1926, the people of Dayton and Rochester were thrown into a near-panic when blinding flashes of light illuminated areas for miles around with the brilliance of mid-day. These flashes usually came in the evening, about nine o'clock. Following the blinding flashes, heavy detonations came from somewhere in the sky. In each case, the receding drone of an airplane motor revealed that it must be some sort of aviation stunt.

Some weeks later the Army Air Corps announced that a method had been invented for taking aerial photographs of large areas at night, stating that by the use of giant bombs of flashlight powder it was possible to photograph territory equal in size to the entire business district of a city such as Rochester.

Details were not announced, but the value of such an invention was immediately appreciated. Commercial concerns immediately welcomed the innovation, and sought from Army authorities permission to use the idea for banquet photography and other small-scale phases of night picture taking. Newspapers saw the possibilities of quickly surveying storm and flood areas, "covering" night disasters without waiting for the light of day to reveal new horrors in picture form. But the Army saw possibilities of increasing military efficiency many times by the use of the new invention, and the actual method remained undisclosed.

The interesting part of the story, and the part that has never before been published, concerns the man who in-



The Capitol at Washington as photographed from the air about nine o'clock at night.

vented the device that makes possible accurate and clear night photography from an airplane. He is Lieutenant George W. Goddard, Air Corps, U. S. Army, said by those who know to be one of the two best aerial photographers in the world. He is now in the Philippine Islands, on tour of duty at Camp Nichols, Rizal.

Except for a word of praise spoken in the halls of Congress at Washington, and letters of appreciative recognition from high Army officials, Lieutenant Goddard has remained entirely in the background. Yet it was he who conceived the idea that made night aerial photography possible, worked it out in Government laboratories, tested it under extremely hazardous conditions, and developed his invention to the point where night photographs can be distinguished only with difficulty from those taken in the full light of noonday sunshine.

In many cases, indeed, night photographs taken with the Goddard flashlight invention are better in detail than daylight shots taken in World War times, when aerial photography was supposed to have reached its greatest possible efficiency.

The field of night air photography was absolutely untouched when Lieutenant Goddard went to McCook Field, Dayton, at the end of 1924. In less than a year, he had produced encouraging results. At the end of two years, he had perfected the apparatus for aerial flashlight pictures.

He first started seriously to work on the problem in May, 1925. He took a plane up, carrying heavy charges of flashlight powder encased in a small glider—a "flying torpedo." This was carried under the fuselage of the plane, attached to a cable which could be released at the proper moment, allowing the torpedo to explode several hundred feet behind the plane. It was believed that the flash would be fast enough to counteract the speed of the plane, with the camera shutter set for time exposure. The results, however, were not satisfactory. The field was blurred and dim.

Dr. Kenneth E. Mees, head of the research department of the Eastman Kodak Company, became



One of the best night photographs ever taken: Dayton, Ohio.



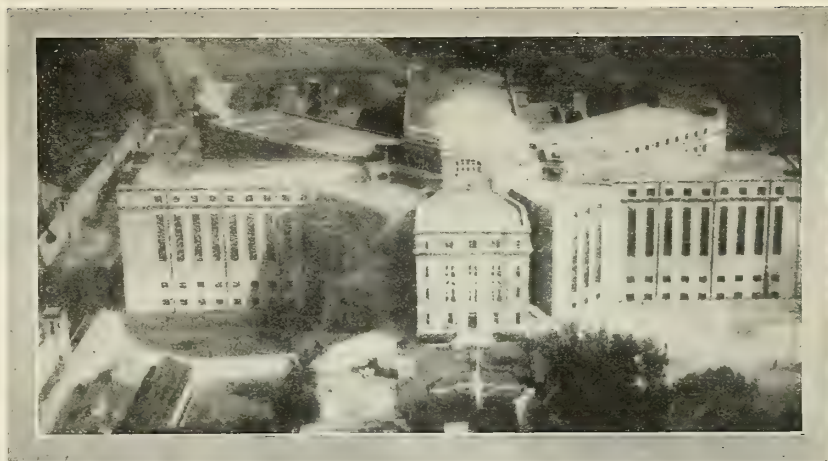
greatly interested in aerial photographic work at this period. Dr. Mees is one of the world's most eminent authorities on the scientific aspects of light. Lieutenant Goddard flew an Army plane to Rochester, where Dr. Mees set up a light meter on the ground to determine the actinic qualities and intensity of light that came from the flashlight bomb. He was discouragingly pessimistic about the results. Goddard flew his plane back to Dayton with the feeling that five months' work had gone for nothing.

It was apparent that the method of taking aerial photos by time exposure and speed flashes could never be made successful. The necessary momentum of the plane was too great to stop motion on the ground, for one thing, and again the weather had to be counted on. Dampness in the air retards the speed at which flashlight powder burns. Some method had to be devised whereby a snapshot exposure of the camera could be employed.

After months of laboratory work, Goddard hit upon a plan which accomplished this. He constructed a device for automatically synchronizing the flash with action of the camera shutter set for snapshot exposure. The difficulties in timing flash and camera, which for safety's sake and for proper results must be several hundred feet apart, can readily be appreciated. The mechanism of the device which accomplished this, by orders of the War Department, still remains a secret.

The following November, after more months of careful work, Goddard flew back again to Rochester to try out the invention with the assistance of Dr. Mees's apparatus. This time, the scientist set up his light meter on the Eastman Tower, 16 stories above the ground.

The experimenters took off unannounced in a Douglas transport plane, carrying a 14-foot bomb filled with 75 pounds of flashlight powder and equipped with a specially designed time fuse. The "flying torpedo" idea, had been abandoned for a bomb that could be released on a parachute, unattached to the plane. The bomb had been care-



Within half an hour after this photo of the penitentiary at Fort Leavenworth was taken, it had been developed and sent by telephoto to New York, Chicago and San Francisco.

fully constructed so that the casing would be entirely consumed in the explosion, leaving nothing to fall on city streets with possible disastrous results. At 3,000 feet the plane passed over the tower where Dr. Mees had his light meter set up, and the bomb was released.

The livid flare and the detonation that followed frightened the city below almost beyond control. People poured out of houses, out of buildings, thronged the streets. (The flash is so intense that temporary blindness is caused if a person happens to be star-gazing when the bomb is released. The detonation of a bomb the size of the one released over Rochester that night can be heard for nearly 20 miles.)

Lieutenant Goddard flew the plane back to Britton Field, and with a premonition of success sped back to town to develop his films and check results with Dr. Mees.

"We got a wonderful picture," Goddard said. "Everything stood out sharp and clear. Automobiles were plainly visible in the streets below, the street lamps sharp and clear. All data were complete. This time Dr. Mees was enthusiastically optimistic, and we returned to Dayton highly elated."

They lost no time in telegraphing the Chief of Air Corps and reporting the success of the new invention.

But things didn't always go as smoothly as that. Many problems remained to be worked out, even after the first successful night photograph had proved the practicability of the invention. Some of the risks that were taken offer a thrilling sequel to war-time flying over the fields of France.

In one of the earlier experiments over the airdrome at Rochester, Goddard took off in a Standard observation plane with Dr. S. M. Burka, carrying one of the early-model "torpedoes" with its explosive cargo hooked under the fuselage. The glider had small red light at each wing tip so its gyrations could be observed from the plane. At a given signal the glider was released. With about 50 feet of cable out, the releasing mechanism jammed. They could neither draw in the cable nor cut it loose.

Goddard says that was one of the most anxious moments of his flying career. Zipping and jerking at the end of the cable behind them was 60 pounds of high explosive. They were flying at about 2,000 feet, and in pitch darkness. If they tried a landing, there would surely be an explosion, with disastrous results. They remained in the air for some 20 minutes, undecided whether to jump or stay with the ship. Finally the glider . . . (Continued on page 280)



Dropping films in speed work. Lieut. Goddard in the front cockpit.



# AERO DIGEST

Published Monthly

THE AERONAUTICAL DIGEST PUBLISHING CORPORATION  
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## HONEST THINKING

IF the aeronautical industry is to advance along safe and effective lines, the editorial pages of its trade publications must forget which side their bread seems to be buttered on, remembering, as humanity too rarely does, that it is not the butter but the bread that sustains life and strength. They must give fair treatment, appreciation, sometimes condemnation, to workers in the field of aeronautics, whether they be rich and big or poor and small. That a man strives earnestly and well for the advancement of the art and industry must be enough to warrant recognition.

When AERO DIGEST was taken over by its present management, it was immediately deluged by brilliant ideas as to how it should be run, what its editorial policy ought to be, and what its financial success would be if this or that plan were adopted forthwith.

Recently some inferential propaganda along somewhat similar lines has slightly hazed the air around our editorial shop—not a fog, just a faint vapor with a slight mephitic smell.

Thanks to the good god of aviation, the industry and art are too busy building to have much time for wastage. But the effort to force us persists to some extent.

However, our nerves are not sensitive, even to attacks upon our pocketbook.

We want no options upon stocks unless we buy them with our own money. We want no directorships nor any of those easy money (or soft mush) emoluments which are offered as a part of efforts still being made to change our expressed views. Funny about that editorial policy of ours. Not so very old, it still is none the less a very stubborn child. Curious. Born right in New York City, it nevertheless insists on trying to be honest!

AERO DIGEST always will endeavor to reflect the activities of this industry as accurately as its eyes can see them—and it has its eyes periodically examined by that well known optician, Dr. Commonsense. Its opinions as expressed will continue independent of suggestions from its advertising.

Our office is all filled up with desks and busy typewriters. These birds who strive to run our show for us might just as well fly on where the good God has scattered more crumbs and provided more roosts for them.

### "C. G. G."

"C. G. G." doesn't see that anything whatever useful was accomplished by the epochal performance of the *Question Mark* when she shattered all world's records during her epochal flight above California. That is one reason why we are glad that the mind of the editor of "The Aeroplane," his publication, is operative in Merrie England rather than in the United States, influencing (if any) British, not American minds.

"C. G. G." seems to be a sort of ailment. Heaven be thanked, not a contagious one.

It bodes well for American efforts to retain leadership that any influential European (we suppose "C. G. G." is an influential European) should fail to see utility in the superb performance of the *Question Mark*.

One reason why American industry makes handsome profits is that Britain disapproves of labor saving machinery. It is in line with that British thought, which has brought about and permitted to continue the cancerous unemployment evil which British statesmen and economists find themselves powerless to combat, that the British mind should see no utility in the *Question Mark's* performance. Had the *Question Mark* travelled a straight line, it would have been, when it landed, 12,000 miles away from the point of its take-off. It broke every endurance flight record known to man or bird in the world's history. But "C. G. G." calls it a "dud stunt."

By the same token so was Trafalgar Bay. But Englishmen performed that "stunt." Therefore, it probably was not a "dud" to Grey. If Grey had lived in 1776, he probably would have considered the battles of Lexington or Yorktown inconsequential affairs.

Fortunately, none of these was a "dud" to the American mind. It seems to be a different sort of mind.

The flight of the *Question Mark*, by reducing fuel records and increasing pay load, performed a very useful service to commercial aviation, as, thanks to American common sense, is obvious to everyone this side of the ocean.

Our plane's astounding demonstration of the merit both of the American-designed plane, and the American-built engines gives us commercial courage. To be sure that doesn't help Grey; perhaps he needs no help. We do, and it does help us.

Moreover, during this astoundingly useful "stunt," fog and temperature conditions were tested through a period of time previously unknown.

Such practical, visual demonstrations, too, naturally impress the mass mind, which cannot be expected readily to accept the statements of technicians and theorists. But the *Question Mark's* achievement was proof positive—proof positive even to the "show me" intellect, of which fortunately (for visionaries who will accept anything are as dangerous as Greys who accept nothing), we have our share. The episode leaves us in a "Hurrah for Grey" state of mind which is extremely cheerful. Hurrah for Grey—three thousand miles away and influencing a public other than our own!

## COMMERCIAL AVIATION AND GOOD MANAGEMENT

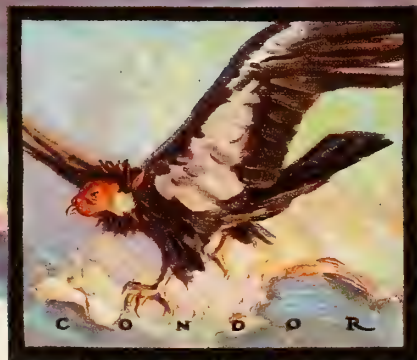
THE fact that Western Air Express actually earned net profits of \$720,777 in the year is, of course, one more proof that aviation is a practical hard cash, offering opportunities for sensible investors of hard cash. Good management, friends, Romans, countrymen! Knowing the game, Harris Hanshue sees that his crowd plays right.

Western Air Express is operated without fictitious or wasteful overhead. It also is operated skillfully, with highly intelligent craftsmanship and professionalism. A good commercial game well played of course makes money. Western Air Express securities have been dealt with in the highly sacred financial regions of this town, but that does not mean, in this case, that the splendid, growing organization is operated for stock gambling purposes. It is operated straight, open and above-board for commercial air transport purposes. Hence its success.



THE BERRYLOID FLEET NO. TWO

Fokker Red, French Gray, Black and Waco Maize, Berryloid colors in a combination suggested by the Condor, beautify and protect this Fokker Super-Trimotor.

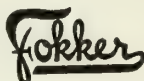


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and  
*Berryloid*  
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AIRCRAFT CORPORATION  
OF AMERICA

Hasbrouck Heights, N. J., Feb. 28, 1929

BERRY  
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FOKKERS

Berry Brothers, Inc.,  
Detroit, Michigan.

Attention Mr. Colby.

Dear Mr. Colby:

Since first adopting Berryloid in 1927, we have found great satisfaction for ourselves and our customers in your product. On all of the standard types of planes manufactured by the Fokker Aircraft Corporation, from the single-engined Universal, to the giant Super-Trimotor transports, Berry Brothers nitrates, dopes, lacquers, primers and Lionoll go hand in hand with other excellent products, in the manufacture of ships of which we are proud.

Yours very truly,

FOKKER AIRCRAFT CORPORATION OF AMERICA.

*C. M. Aument*  
C. M. AUMENT  
Production Manager

CMA:MG

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SON, ANOTHER LARGE  
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# THE FLYING GENERAL

**D**URING the past year General James E. Fechet, Chief of the Air Corps, made flights to practically every state in the Union. He made one transcontinental flight and visited practically every Air Corps station in the country. Among others, a flight was made to the upper peninsula of Michigan, where landing fields are an unknown quantity. On one occasion during this flight, it was necessary to land on a copper mine dump in a river bed. During this flight a 70-mile hop was made across Lake Michigan. When the General is on a cross-country flight, he usually follows the airline. In the far West he has flown an airline course across some of the most barren country in the United States — even across uninhabited deserts.

General Fechet's flying time for the year 1928 amounts to 397 hours and 15 minutes. During this time, he made flights in fourteen distinct types of airplanes, namely, O1, O2-H, Amphibian OALC, O1-C, Thomas Morse XO-18, O2-J, Thomas Morse XO-19, O-11 (Observation) C-1, C-2 and C-3 (Transports), A-3, the Junkers low-wing monoplane and Sikorsky Amphibion. Several of his flights made during the year were especially significant, such as the flight from Washington, D. C., to Panama. This flight was made with Assistant Secretary of War F. Trubee Davison for the purpose of inspecting Air Corps activities in the Canal Zone. While on this trip, they visited every country in Central America. Needless to say, a large portion of this region is unpopulated, and the result of a forced landing can only be left to the imagination. The flight to Panama and return was made in amphibians. The difficulties encountered in attempting a flight of this nature may be appreciated from the fact that in the Central American countries there are practically no facilities for servicing an airplane. In other words, the crew was left entirely to its own devices and could look for no assistance.

Another of General Fechet's extended flights was the one to Greenley Island, Labrador, which was undertaken for the purpose of salvaging the transatlantic airplane, *Bremen*.

This flight was also accomplished under difficulties, for a large portion of this country is likewise unpopulated. Facilities for the care of an airplane in these regions are unknown. Even though the flight was made in an amphibian plane and most of the flying was done over the water, icebergs and smaller pieces of ice which dotted the water presented a considerable hazard in case of a forced landing.

While on this flight, General Fechet once more displayed that quality which epitomizes the real aviator. In flying from St. George, New Brunswick, to Pictou, Nova Scotia, en route to Greenley Island, he found it necessary to make a land hop of about 60 miles over a range of mountains. Because this range of mountains was so heavily enshrouded with fog, three attempts to cross it proved

unsuccessful. A landing was, therefore, made in the water near South Maitland, Nova Scotia, in the Bay of Fundy, at a time when the tide was going out with terrific force. The crews were able to anchor the ships only with considerable difficulty, the tide having been so strong that it dragged the anchors. The anchors finally took hold only a short distance from the banks of the bay. Shortly

after this the anchor line of the accompanying ship broke because of the heavy pull of the tide. Capt. Ira C. Eaker, pilot of the accompanying ship, had but one thing left to do,—start the motor and try to get to Pictou.

Realizing that if the anchor line on the accompanying ship parted, his own line was apt to do likewise, and that if this happened the ship would be on the rocks before the motor could be started, General Fechet took immediate steps to prevent this contingency by attempting to get under way. The pull on the anchor line was so great that it was impossible to get the rope off the cleat on the bow of the ship. The only way, therefore, to free the amphibian from the anchor line was to cut the rope. This was done and the motor was

started immediately. When taxiing out to the middle of the bay in order to take-off, the plane ran aground at the exact place where Captain Eaker had previously taken off. Fifteen minutes after the plane ran aground the crew was walking around it on dry ground. The tide at this place is greater than anywhere else in the world. It is said that at times the tide is as great as 51 feet, which accounts for the swiftness of the water.

To wait for the return of the tide would have meant disaster. General Fechet foresaw this and avoided it in an unusual way. At this time, of course, the amphibian was high and dry as a boat; that is, the wheels were up. He set to work digging holes in the sand directly beneath the point where the wheels roll down. These holes were dug deep enough to allow the wheels to roll completely down. However, the weight of the ship was still on the hull. He then started to dig the sand from under the hull, allowing the weight of the ship then to be on the wheels. The amphibian was thus converted into a land-plane; that is, the weight was on the wheels and the tail skid. With the help of several men and by starting the motor, he was able to taxi out of the holes. He was then in a position to take off.

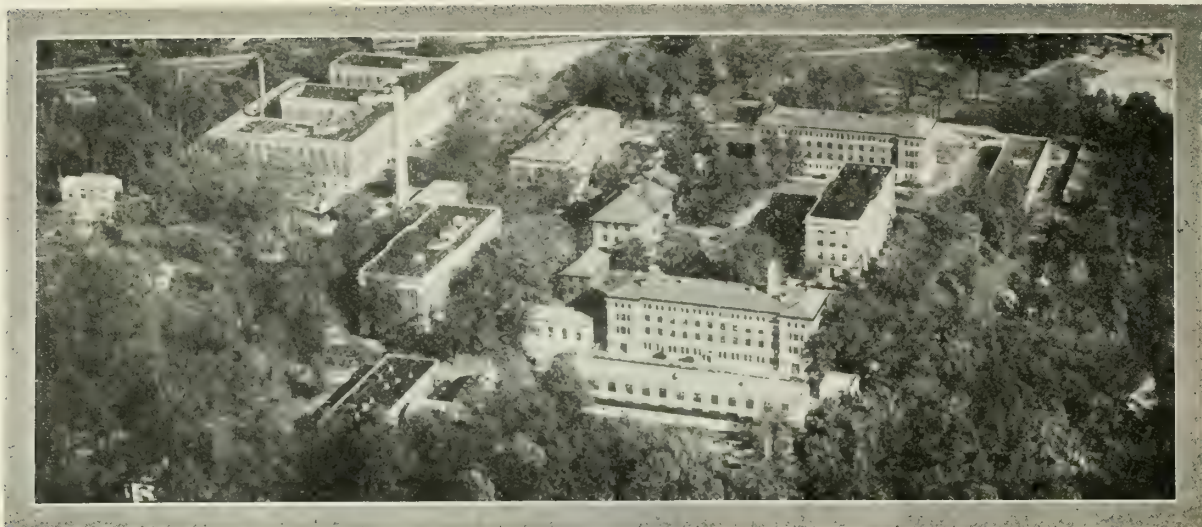
The General had accomplished a feat which had never been done before, or since that time; that is, he landed the amphibian as a seaplane and took it off as a land-plane from exactly the same place. An hour following his take-off there would have been 30 feet of water at this place. Although safely in the air, the General's troubles were not over. The fog was still in the mountains and, no longer having



Major General James E. Fechet

(Continued on page 290)





Buildings of the National Bureau of Standards

# AERONAUTIC RESEARCH AT THE NATIONAL BUREAU OF STANDARDS

By Lyman J. Briggs, *Assistant Director Research and Testing*

(Continued from the March issue)

## Lattice Girders for Airships

**R**IGID airships demand girders of extremely light construction. The first successful girders for this purpose were the Zeppelin triangular girders constructed of channel chord members tied together by lattice crosses. The investigation conducted by the Bureau of Standards for the Navy Department during the construction of the *Shenandoah* showed that these girders failed by twisting of the channels at stresses much below the yield stress of the material, the failure being determined by the low torsional stiffness of the channels.

Since then the Bureau of Standards has been conducting investigations for the purpose of determining how the strength of these girders could not be increased. Special girders constructed with tubular chord in which the torsional stiffness was much greater, showed stresses approximately equal to the yield stress of the material. For girders as light as those of the *Shenandoah*, no other design comparable in strength with this tubular construction has been found.

However, with increasing size of airships it has been possible to use thicker metal with correspondingly increased torsional stiffness. The new type of box girder designed by the Goodyear Zeppelin Company at present shows for these heavier ships some small advantage in strength to weight ratio over the girders with tubular channels and has the advantage of cheaper construction.

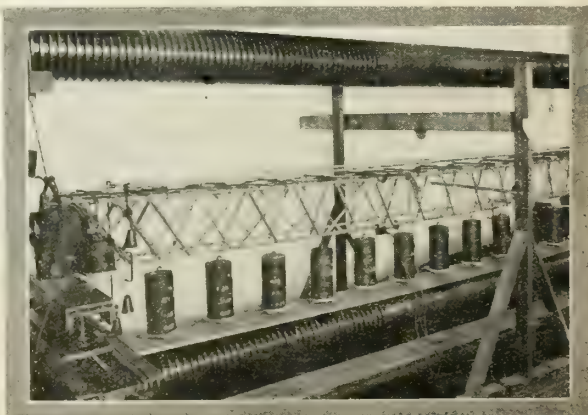
## Strength of Welded Joints in Tubular Fabrication

The purpose in this investigation is to determine the strength of all types of welded joints in steel tubing which are now used in aircraft. The program also includes other types of welded joints which will be tested in order to develop, if possible, joints which have greater strength or which possess other advantages, such as ease of fabrication. The proposed program and testing procedure was sent to

19 of the principal airplane manufacturers in this country for their comment. The response indicated that the systematic study of the strength of welded joints would be of great interest to the industry. A standard welding procedure has been provided through the cooperation of the American Welding Society. Chromium-molybdenum steel will be employed in most of the work.

## Tubing Investigation

Tubing is rapidly growing in favor as a structural element in aircraft. In the structure it is called upon to carry both axial and transverse loads in all conceivable combinations. The Bureau of Standards was, therefore, requested to conduct a series of tests to determine the safe carrying capacity of duralumin and chromium-molybdenum steel tubing over a wide range of thicknesses, diameters and slenderness ratios, under combined loads varying from pure axial loads to pure transverse loads. This investigation has been in progress for about two years.



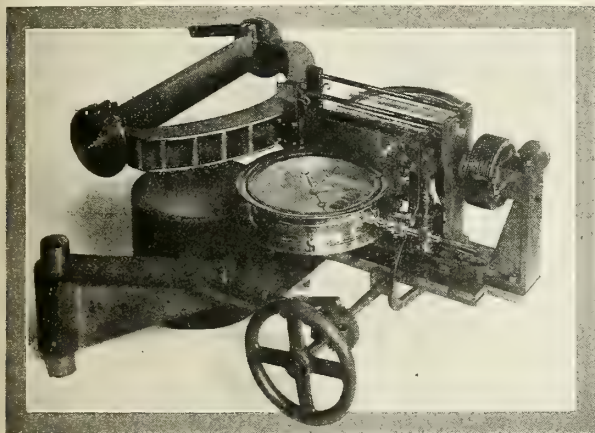
Testing airship girder under compressive and transverse loads.



As a result, diagrams are now available suitable for the design of structures over the whole range of commercial chromium-molybdenum tubing, and for a limited range of duralumin tubing. The investigation is being continued to cover other sizes of duralumin tubing and to extend the knowledge of the behavior of chromium-molybdenum steel tubing as far beyond the present commercial practice as seems feasible.

#### High-Frequency Fatigue Machine

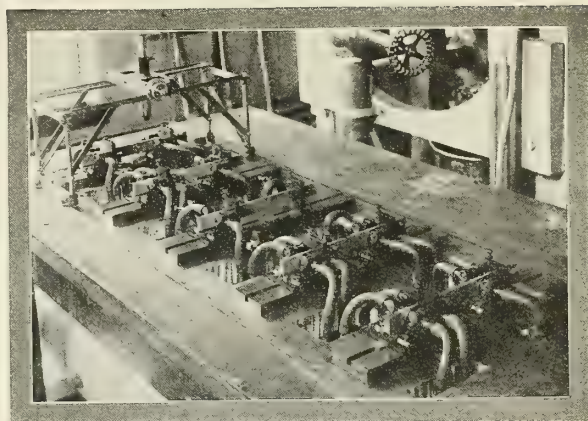
Metals which are subject to a cyclical stress, such as that arising from vibration, will eventually fail unless the maximum stress applied during each cycle is kept below a certain limit, which is known as the fatigue limit of the material in question. The extended use of duralumin in aircraft structures, where vibration is always present, makes it necessary to determine the fatigue limit of this material. If a steel specimen withstands a given extreme-fiber stress during ten million cycles of stress, experience has shown that it may reasonably be expected to withstand this stress indefinitely. But the characteristics of duralumin and some of the other light alloys are such that it is necessary, in determining the fatigue limit, to subject the test specimens to alternations of stress running into hundreds of millions of cycles.



Balance used by the Bureau of Standards for measuring the aerodynamic characteristics of airfoils.

To reduce the time required for making such observations, a high-frequency fatigue method has been developed at the Bureau of Standards. The test specimen, which consists of a rectangular bar, is supported at its nodal points on compressed air cushions. It is kept in vibration by an air drive, consisting of one or more compressed air nozzles ending in circular plates. The nozzles are mounted so that the plates are close to the vibrating bar but not touching it. The escaping air causes a reduction in pressure between the nozzle and the bar, causing the latter to deflect toward the nozzle. The resulting reduction in flow and the restoring force of the bar in turn cause the bar to move in the opposite direction, where it comes within the field of action of a second nozzle, and a vibration of constant amplitude is soon built up. Frequencies from 200 to 450 cycles per second (depending on the dimensions of the bar) have been obtained, and extreme fiber stresses as high as 23,000 pounds per square inch have been used. At these high stresses a bar will fail in an hour or so, a minute crack developing across the mid-section which stops the vibration.

The observed frequency, and the ratio of the amplitude of the center of the bar to that of the free end, check well with values calculated from Rayleigh's theory, which pro-



Group of high-speed fatigue testing machines.

vides a basis for computing the fiber stress for a given amplitude. Fatigue limits determined by this method give somewhat lower values than those obtained at low frequencies. The cause of this discrepancy has not yet been determined. The fatigue limits of an extended series of aluminum alloys are now under investigation.

#### Engine Research and Testing

The Bureau of Standards was the first to develop apparatus for the testing of aircraft engines under conditions of temperature and pressure corresponding to high altitudes. In this work the engine is mounted in an airtight altitude chamber of massive reinforced-concrete construction. The power is measured by connecting the engine through stuffing box to an electric dynamometer outside the chamber. The exhaust gases are removed through a manifold and pipe connected to an outside pump, the pressure in the manifold being kept equal to that in the chamber. The pressure and temperature of the air supply to the intake manifold, and of the air in the chamber, are adjusted to represent the altitude desired.

This equipment is not only suitable for determining the performance of engines at high altitudes, but is also ideally adapted for the testing of engines equipped with supercharges. It has sufficient cooling capacity to permit tests to be made on supercharged engines of 400 horsepower with full throttle up to altitudes of 25,000 feet.

Altitude tests have so far been confined to water-cooled engines. The testing of air-cooled engines under altitude conditions requires in addition a forced circulation of air over the engine cylinders at a speed of approximately 80 miles per hour as well as a refrigerating system for removing the heat delivered to the air-stream by the engine. An altitude chamber for testing air-cooled engines up to 200 horsepower is now under construction.

The Aeronautics Branch of the Department of Commerce requires that aircraft engines shall pass an official type test before being used in interstate commerce. The power rating is based upon the average power developed during a five-hour test at full throttle and rated speed. The rated speed is determined by the manufacturer and is the speed of the engine with full throttle in steady horizontal flight near sea-level conditions. The engine must also run an additional 45 hours at not less than 90 per cent of the rated power without a major failure. These tests may be conducted by the Bureau of Standards, the Army or the Navy.

#### Kinetics of Gaseous Explosive Reactions

An extended study of the rates of gaseous explosive  
(Continued on page 290)



# KITE-FLYING AND BLUE SKY

By Don Rose

AS I write this I am still bruised and bent from battling bitterly with an income tax blank. It was a finish fight, and I came out the winner by approximately fourteen cents. Once again the Government will have to stagger along without much help from me.

Once again it was the exemptions that saved me. I have what might be called an elegant sufficiency of two-legged exemptions of all ages, sexes and species, except twins, and at this season of the year I marshal them all in defensive formation and dare the Internal Revenue Department to do its worst. Each of the youngsters has a market value of \$400 on the hoof, and the wife rates \$1500, F.O.B. Washington, D. C., and when I stack them all up against my income for the fiscal year of 1928, the poor thing goes down for the count. The Government rages and gnashes its teeth, but there's nothing it can do. I know the law and I know my rights, such as they are.

There never has been any real point in my lashing myself into a fury of financial flipflops and getting all gummed up in schedules in order to make an income tax return, since nothing ever comes of it. But I always do it. One reason is that I have always felt that it might be a proper and patriotic thing to pay an income tax. It might even be pleasant, as I can gather from the enthusiastic rush of all my friends and neighbors to pay their respect to Mr. Andrew Mellon at this season of the year. When I see their eagerness and anxiety, I long to join the party. I would be willing to join any party, if it would give me a chance to pay an income tax.

But all sorts of things stand in my way. First there are my dear little exemptions. In the second place there is my income, or rather, there isn't my income. Whether you figure it gross or net, forwards or backwards, by the week, month or year, my income isn't the sort of thing to start a Bolshevik riot among the proletariat. Then there are the deductions. Everybody deducts from my income, beginning with the Building Association at the first of the month and ending when the money is all gone. Crowds of creditors are waiting around on pay day to make deductions from my income, though the only thing I can deduce from it is that it isn't big enough.

So everybody else goes bragging around, telling how much and how often he has paid the Government, while I must admit that I can't buy even a nickel's worth of our Federal common stock. The children come home crying about it. "Popper," they say. "Popper,—why don't we pay an income tax? All the other children's poppers pay income tax,—why can't we pay one? Ain't we got one?"

What can I say to them? I can't talk to them of the exemptions of which they are the innocent cause, for childhood is so sensitive, and never shall it be said that my children thought themselves unwanted. So I smile bravely and say cheerily, "Never mind, children. I guess the Government just doesn't want any more money." But even the children know that this is not and never can be true.

So every year I take a week-end off from wrestling a living out of a rheumatic typewriter, and work out an income tax return. I usually take the form adapted to those of incomes of not more than five thousand a year, which is of course, absurd. It never comes out twice the same, but it is always interesting. For the benefit of any of the customers who may have found the official document a little complicated, I offer a digest of my own statement which will indicate the best possible way of figuring out the tax

and give just as good results as any other. Next year you may try it for yourselves, and I hope you will appreciate my help.

I start with my salary for the past year, which I can figure with a little simple arithmetic and some help from the boy who is in seventh grade. Add the dollar I picked up at the Air Races, subtract the fifty cents that fell through the hole in my working trousers, add \$480 for rents received and take away \$476 for alterations and repairs. Add profit from sale of real estate, consisting of one load of sand to my next-door neighbor who keeps chickens, and subtract five dollars for the Sunday paper. Subtract bad debts, add bad debts, subtract fire losses, add fire insurance; add one dollar borrowed from Jim Ray on July 14 at five o'clock in the afternoon, and subtract three dollars lost on the Presidential election. Add fourteen cents for can of baked beans sold to neighbor across the street. Add forty-two cents for riding on railroad with obsolete ticket, subtract ninety-eight cents for one cigarette lighter that won't light. Subtract church contributions,—one dollar and a quarter; add interest on money in savings bank—twenty cents. Add four dollars for overdraft at the bank and take away three dollars for subscription to magazine to help a poor boy through college. Take away another thirty cents for trying to find the boy afterwards. Subtract one umbrella and add fourteen cents found in the pockets of my full dress suit. Add the profit from a vegetable garden; take it all away and buy Sloan's Liniment. Take away \$3,500 for being married and living with a wife on the last day of the taxable year; take away thousands of dollars for children under 18 years of age, because mentally or physically defective; figure the tax on the net income at 1½ per cent, and behold—the government owes me \$84. There only remains the problem of collecting it.

There's one clause in the confessional that has never given me any real help one way or the other. This is the one dealing with profit and loss in the stock market, which is the real joker in the deck for the current crop of confessionals. Three-quarters of my friends and all my neighbors have been making thousands and thousands of dollars out of the stock market for the last year. At least they have been telling me so, which may be one reason why they called it a bull market. Nobody ever admitted to me that they had lost anything on the ticker, and if they have told the truth, the whole truth and nothing worse than the truth, then the Government will have to send a ten-ton-truck into our precinct to haul away its share.

I blush to admit in public that I didn't make any money out of Wall Street during the past year. By the same token I didn't lose any either, and I hope all my friends can say the same when they unburden themselves to the Internal Revenue Department, though I bet they won't. But I have had a perennial pessimism in regard to myself as a stock-market sharpshooter ever since my one wild fling in the ring. It happened a long while ago, when I had some loose money which was nobody's business but my own. I don't have it any more, and if I did, I'd say nothing about it. It wasn't much, but such as it was I bet it on a short-horn motor stock which was good for a fifty point rise. A garage helper told me so, and it seemed to me that he should know, and anyway it was probably as good advice as you usually get for nothing. I bought in at eleven and when the stock responded to my prayers and began a steep climb, I took a swift course in margineering and staked out a thin claim thereby on a (Continued on page 252)



# ALL-AMERICAN AIRCRAFT SHOW

DETROIT, MICHIGAN, SATURDAY, APRIL 6th TO SUNDAY, APRIL 14th

**T**HE second annual All-American Aircraft Show, opening in Convention Hall, Detroit, Michigan, April 6, will present 107 ships and in the accessories section, 107 manufacturers. This constitutes the largest entry list of any aeronautical exposition ever held in this country. Had there been more room in Convention Hall, the list would have been much larger.

A review of the plane entries reveals in striking terms the magnitude of the commercial aircraft industry, and to those who viewed the first All-American show in Detroit last April, it tells a story of amazing progress. Practically all of the older manufacturers are presenting models that are either entirely new, or refinements of 1928 products. In addition there are no less than a dozen exhibitors who are showing for the first time.

Sixty-two airplane manufacturers are participating in the exposition, which is being staged under the joint auspices of the Detroit Board of Commerce and the Aeronautical Chamber of Commerce of America. Factories in 20 different states are sending airplanes to the show.

Expansion in the accessories field has kept pace with plane production, judging from space reservations. Approximately 20,000 square feet are being given over to accessories.

Every commercial aircraft owner in the country has been invited to fly to Detroit during the progress of the show. Detroit, by official proclamation of Mayor John C. Lodge, will be observing National Aviation Week at that time. Schools, civic organizations, and public officials have joined in a movement to make the show an occasion for a general get-together of all the forces behind the development of the country's aeronautical activities.

A survey of the Greater Detroit area shows 11 landing fields, able to take care of as many as 5,000 incoming ships. These fields will be specially marked during Aviation Week, and there also will be special servicing arrangements. Each

plane owner is to receive a map showing the field locations.

The program of activities in Detroit during Aviation Week, in connection with the All-American Aircraft Exposition has been arranged as follows:

**SATURDAY, APRIL 6th**—Dedication of Detroit Air Terminal Building at Municipal Airport, French and Lynch Roads, 3:00 p. m.

Official opening of All-American Aircraft Show at Convention Hall, 7:00 p. m.

**SUNDAY, APRIL 7th**—Exposition open from 10:00 a. m., until 11:00 p. m.

**MONDAY, APRIL 8th**—Boy Scout Day—Industrial Night—Commercial Airplane Manufacturers' Session—Intercollegiate Aviation Society Session.

**TUESDAY, APRIL 9th**—Engineers' Day—Service Club Night—Commercial Airplane Manufacturers' Session—Society of Automotive Engineers' Session (National meeting)—Aeronautical Chamber of Commerce Session—Intercollegiate Aviation Society Session—S. A. E. Banquet, 6:30 p. m.

**WEDNESDAY, APRIL 10th**—Michigan Day—Board of Commerce Night—S. A. E. Session—Aeronautical Chamber of Commerce Session—National Glider Association Conference—National Glider Dinner, 6:30 p. m.

**THURSDAY, APRIL 11th**—Women's Day—International Night—Air Transport Operators' Session—Banquet at Windsor, Ontario, 6:30 p. m.

**FRIDAY, APRIL 12th**—Army and Navy Day—Educational Session, Aeronautical Chamber of Commerce.

**SATURDAY, APRIL 13th**—Fraternal Night—Aeronautical Chamber of Commerce Banquet, 6:30 p. m.

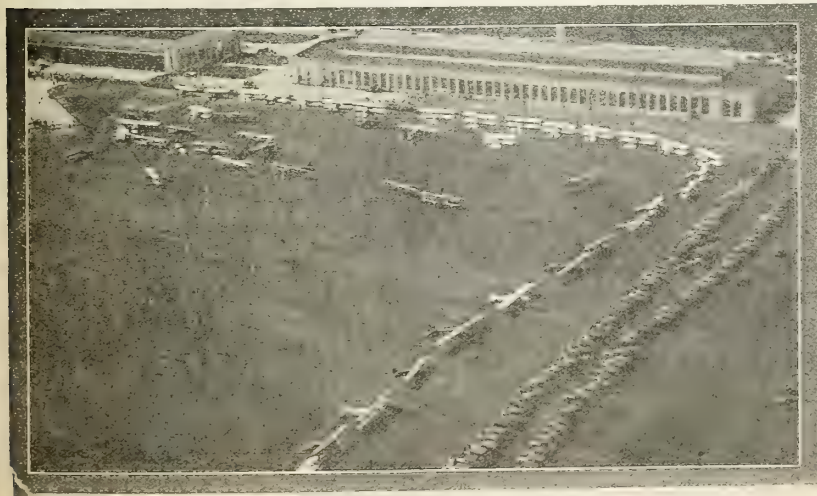
**SUNDAY, APRIL 14th**—Exposition open from 10:00 a. m. until 11:00 p. m.

The Detroit Aeronautic Meeting of the Society of Automotive Engineers, Aeronautical Chamber of Commerce, and the Detroit Board of Commerce Aeronautic Committee will be held on April 9 and 10 at the Book-Cadillac Hotel. The committee is composed of Capt. L. M. Woolson, chairman, B. J. Lemon, W. C. Naylor and W. B. Stout.

On Tuesday, April 9th, the S. A. E. will follow this schedule: 10:00 a. m.—motorcoach trip to Ford Airport; 12:30 p. m.—lunch at Ford Motor Co.; 2:00 p. m.—visit to Detroit Aircraft Show; 6:30 p. m.—Aeronautic Dinner.

On Wednesday, April 10th, 10:00 a. m.—General Standardization Conference and meetings of S. A. E. Aircraft Engine Division and Aircraft Division; 2:00 p. m.—Technical session at the Crystal Room, Book-Cadillac Hotel; 6:30 p. m.—S. A. E. Technical session at the Crystal Room.

The Exposition will be open daily from 10:00 a. m. until 11:00 p. m.



Ford Airport where airplanes will be demonstrated during the air show.



# Exhibitors at the All-American Aircraft Show

Acme Aircraft Corporation,  
Rockford, Ill.  
Advance Aircraft Company,  
Troy, Ohio.  
Aeromarine Klemm Corp.,  
New York City.  
Alexander Aircraft Co.,  
Colorado Springs, Col.  
Alliance Aircraft Corp.,  
Alliance, Ohio.  
American Aeronautical Corp.,  
New York City.  
American Eagle Aircraft  
Corp.,  
Kansas City, Mo.  
Arrow Aircraft & Motors  
Corp.,  
Havelock, Nebr.  
Bellanca Aircraft Corp.,  
New Castle, Del.  
Berliner Aircraft Co., Inc.,  
Alexandria, Va.  
Boeing Airplane Co.,  
Seattle, Wash.  
Buhl Aircraft Co.,  
Marysville, Mich.  
Butler Aircraft Corp.,  
Kansas City, Mo.  
Cadillac Aircraft Corp.,  
Detroit, Mich.  
Century Aircraft Corp.,  
Kansas City, Mo.  
Cessna Aircraft Co.,  
Wichita, Kansas.  
Chance Vought Corp.,  
Long Island City, N. Y.  
Command-Aire, Inc.,  
Little Rock, Ark.

## Exhibitors of Airplanes

Consolidated Aircraft Corp.,  
Buffalo, N. Y.  
Cunningham-Hall Aircraft  
Corp.,  
Rochester, N. Y.  
Curtiss-Reid Aircraft Co.,  
Ltd.,  
Montreal, Que.  
Curtiss-Robertson Airplane  
Co.,  
Anglum, St. Louis Co., Mo.  
Davis Aircraft Corp.,  
Richmond, Ind.  
Doyle Aero Corp.,  
Baltimore, Md.  
Driggs Aircraft Corp.,  
Lansing, Mich.  
Eastman Aircraft Corp.,  
Detroit, Mich.  
Fairchild Airplane Mfg. Co.,  
New York City.  
Fokker Aircraft Corp.,  
New York City.  
Fleet Aircraft, Inc.,  
Buffalo, N. Y.  
General Aircraft Corp.,  
Buffalo, N. Y.  
Gliders, Inc.,  
Detroit, Mich.  
Great Lakes Aircraft Corp.,  
Cleveland, Ohio.  
Hamilton Metal Plane Co.,  
Milwaukee, Wis.

Heath Airplane Co., Inc.,  
Chicago, Ill.  
Invincible Metal Plane Co.,  
Manitowoc, Wis.  
Ireland Aircraft, Inc.,  
Garden City, N. Y.  
Keystone Aircraft Corp.,  
(Loening Division)  
New York City.  
Knoll Aircraft Corp.,  
Wichita, Kansas.  
Kreider-Reisner Aircraft Co.,  
Hagerstown, Md.  
Kreutzer Aircraft Corp.,  
Los Angeles, Calif.  
E. M. Laird Airplane Co.,  
Chicago, Ill.  
Lincoln Aircraft Corp.,  
Lincoln, Nebr.  
Lockheed Aircraft Co.,  
Los Angeles, Calif.  
Mahoney-Ryan Aircraft Corp.,  
St. Louis, Mo.  
Metal Aircraft Corp.,  
Cincinnati, Ohio.  
Mohawk Aircraft Corp.,  
Minneapolis, Minn.  
Mono Aircraft, Inc.,  
Moline, Ill.  
Moth Aircraft Corp.,  
New York City.  
New Standard Aircraft Corp.,  
Paterson, N. J.

Nicholas-Beazley Airplane Co.,  
Marshall, Mo.  
Overcashier Aircraft Mfg. Co.,  
Highland Park, Mich.  
Paramount Aircraft Corp.,  
Saginaw, Mich.  
Parks Aircraft, Inc.,  
St. Louis, Mo.  
Pitcairn Aviation, Inc.,  
Philadelphia, Pa.  
Rearwin Airplane Co.,  
Saline, Kansas.  
Simplex Aircraft Corp.,  
Defiance, Ohio.  
Spartan Aircraft Co.,  
Tulsa, Okla.  
Stearman Aircraft Company,  
Wichita, Kansas.  
Stinson Aircraft Corp.,  
Northville, Mich.  
St. Louis Aircraft Corp.,  
St. Louis, Mo.  
Stout Metal Airplane Co.,  
Dearborn, Mich.  
Swallow Airplane Co.,  
Wichita, Kansas.  
Swift Aircraft Co.,  
Wichita, Kansas.  
Travel Air Mfg. Co.,  
Wichita, Kansas.  
Trella Aircraft Co.,  
Detroit, Mich.  
Verville Aircraft Corp.,  
Detroit, Mich.  
Whittlesey Mfg. Company,  
Bridgeport, Conn.

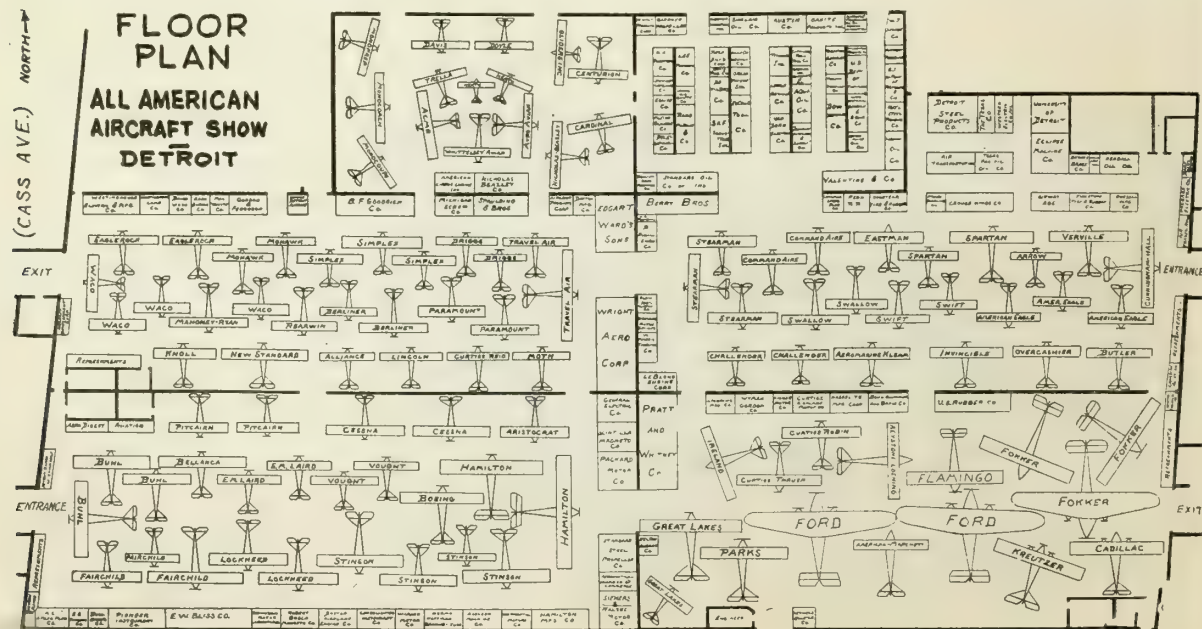
Aero Digest Magazine,  
New York City.  
Aero Supply Company,  
College Point, L. I., N. Y.  
AC Spark Plug Company,  
Flint, Mich.  
Aircraft Development Corp.,  
Grosse Isle, Mich.  
Aircraft Products Corp.,  
Detroit, Mich.  
Airships, Inc.,  
Hammondsport, N. Y.  
Alliance Aircraft Corp.,  
Alliance, Ohio.

## Accessories and Other Products

Aluminum Industries, Inc.,  
Detroit, Mich.  
American Cirrus Engine, Inc.,  
Belleville, N. J.  
Aqua Oil Service, Inc.,  
New York City.  
The Austin Company,  
Cleveland, Ohio.  
Axelson Machine Co.,  
Los Angeles, Calif.

Balsa Wood Company,  
New York City.  
Beck Distributing Co.,  
New York City.  
Bendix Brake Company,  
South Bend, Ind.  
Berry Brothers,  
Detroit, Mich.  
E. W. Bliss Company,  
Brooklyn, N. Y.

Robert Bosch Magneto Co.,  
Inc.,  
Long Island City, N. Y.  
Bohn Alum. & Brass Corp.,  
Detroit, Mich.  
Brownback Motor Lab.,  
New York City.  
Buhl Stamping Co.,  
Detroit, Mich.  
Canadian Aviation,  
Toronto, Canada.  
Champion Spark Plug Co.,  
Toledo, Ohio.  
Cleveland Pneumatic Tool,  
Cleveland, Ohio.



- Consolidated Instrument Co.,  
New York City.
- Continental Motors Co.,  
Detroit, Mich.
- Crouse-Hinds Company,  
Syracuse, N. Y.
- Curtiss Aeroplane & Motor,  
Garden City, N. Y.
- Dayton Airplane Engine Co.,  
Dayton, Ohio.
- Dayton Manufacturing Co.,  
Dayton, Ohio.
- Detroit Steel Products Co.,  
Detroit, Mich.
- Detroit-Wayne Industrial  
Airport,  
Wayne, Mich.
- DeVilbiss Company,  
Toledo, Ohio.
- De Walt Products Corp.,  
Detroit, Mich.
- Dow Chemical Co.,  
Midland, Mich.
- E. I. du Pont de Nemours,  
Parlin, N. J.
- Eclipse Machine Co.,  
East Orange, N. J.
- Elgin National Watch Co.,  
Elgin, Ill.
- Endicotte Forging Co.,  
Endicotte, N. Y.
- Esline Steel Bldg. Co.,  
Detroit, Mich.
- Ex-Cello-O Tool Co.,  
Detroit, Mich.
- Firestone Tire & Rubber Co.,  
Detroit, Mich.
- Gardner Propeller Works,  
Forest Park, Ill.
- General Electric Co.,  
Schenectady, N. Y.
- B. F. Goodrich Company,  
Akron, Ohio.
- Goodyear Tire & Rubber Co.,  
Akron, Ohio.
- Gordon & Ferguson,  
St. Paul, Minn.
- Greenleaf, Inc.,  
Detroit, Mich.
- Green Patents Syndicate,  
Elyria, Ohio.
- Hamilton Aero Mfg. Co.,  
Milwaukee, Wis.
- Harwen Products Corp.,  
New York City.
- Haskelite Mfg. Company,  
Chicago, Ill.
- Heywood Starter Co.,  
Detroit, Mich.
- International Derrick &  
Equip. Co.,  
Detroit, Mich.
- Irving Air Chute Co.,  
Buffalo, N. Y.
- Johnson Airplane & Supply,  
Dayton, Ohio.
- Kelton Aurand Mfg. Co.,  
Bay City, Mich.
- Kendall Refining Co.,  
Bradford, Pa.
- Kinner Airplane & Motor  
Co.,  
Glendale, Calif.
- LeBlond Aircraft Engine Co.,  
Cincinnati, Ohio.
- Leece-Neville Co.,  
Cleveland, Ohio.
- Lee Machinery Co.,  
Detroit, Mich.
- Linde Air Products,  
New York City.
- Lycoming Mfg. Co.,  
Williamsport, Pa.
- MacWhyte Company,  
Kenosha, Wis.
- Michigan Screw Company,  
Lansing, Mich.
- Moto Meter Company,  
Long Island City, N. Y.
- Murphy Varnish Co.,  
Newark, N. J.
- McCord Radiator Company,  
Detroit, Mich.
- National Glider Ass'n,  
Detroit, Mich.
- National Steel Products Co.,  
Dayton, Ohio.
- Nicholas-Beazley Co.,  
Marshall, Mo.
- Norma-Hoffman Bearings,  
Stamford, Conn.
- National Air Pilots Ass'n,  
Cleveland, Ohio.
- Naturaline Company,  
Tulsa, Okla.
- Oakite Products, Inc.,  
New York City.
- Packard Electric Co.,  
Warren, Ohio.
- Pennsylvania R. R.,  
Philadelphia, Pa.
- Pioneer Instrument Co., Inc.,  
Brooklyn, N. Y.
- Pratt & Whitney Aircraft Co.,  
Hartford, Conn.
- Pyle National Company,  
Chicago, Ill.
- Rand McNally & Co.,  
Chicago, Ill.
- Robertson Aircraft Co.,  
St. Louis, Mo.
- H. H. Robertson Co.,  
Pittsburgh, Pa.
- John A. Roebling's Sons,  
Trenton, N. J.
- Rome Wire Company,  
Rome, N. Y.
- Russell Mfg. Co.,  
New York City.
- Russell Parachute Co.,  
San Diego, Calif.
- W. J. Savage Company,  
Knoxville, Tenn.
- Scintilla Magneto Co.,  
Sidney, N. Y.
- B. Russell Shaw,  
St. Louis, Mo.
- Siemens Halske Motor Co.,  
New York City.
- Sinclair Refining Co.,  
New York City.
- SKF Industries,  
New York City.
- Snap-on Wrench Co.,  
Detroit, Mich.
- Society of Automotive En-  
gineers,  
New York City.
- A. G. Spaulding & Bros.,  
New York City.
- Standard Oil Co. of Ind.,  
Chicago, Ill.
- Standard Steel Propeller Co.,  
West Homestead, Pa.
- Stewart Hartshorn Co.,  
New York City.
- Stromberg Motor Devices,  
Chicago, Ill.
- Strauss & Buegeleisen Co.,  
Brooklyn, N. Y.
- Supreme Propeller Co.,  
Wichita, Kans.
- Taylor Instrument Co.,  
Rochester, N. Y.
- Texas Company,  
Chicago, Ill.
- Texas Pacific Coal & Oil Co.,  
Fort Worth, Texas.
- W. Harris Thurston,  
New York City.
- Titanine Company, Inc.,  
Union, N. J.
- E. S. Twining Co.,  
New York City.
- University of Detroit,  
Detroit, Mich.
- U. S. Department of Com-  
merce,
- United States Navy,  
Hydrographic Dept.
- U. S. Rubber Co.,  
Detroit, Mich.
- Valentine & Company,  
New York City.
- Van Dorn Electric Co.,  
Cleveland, Ohio.
- Vacuum Oil Company,  
New York City.
- Edgar T. Ward's Sons Co.,  
Jersey City, N. J.
- Warner Motor Co.,  
Detroit, Mich.
- Western Electric Co.,  
New York City.
- Westinghouse Elec. Co.,  
East Pittsburgh, Pa.
- Westinghouse Lamp Co.,  
New York City.
- Clarence Whitman & Sons,  
New York City.
- Wilson Steel Products Co.,  
Chicago, Ill.
- Wright Aeronautical Corp.,  
Paterson, N. J.
- Wright-Tuttle Motor Co.,  
New York City.
- Wyman & Gordon,  
Worcester, Mass.
- Ypsilanti Reed Furniture Co.,  
Ionia, Mich.

STINSON



STINSON



DAVIS



MOHAWK



ARROW



FOKKER



THE VIEWS ABOVE AND THOSE ON THE FOLLOWING PAGES SHOW SOME OF THE AIRPLANES WHICH ARE TO BE EXHIBITED AT THE ALL-AMERICAN AIRCRAFT SHOW AT CONVENTION HALL, DETROIT, FROM APRIL 6TH TO 14TH, 1929.



# "THE INFANT INDUSTRY"

Facts Revealed By A Study of American  
Aircraft Production Today

By Francis D. Walton

A VOICE that is loud but wholly lacking in originality is calling it "the infant industry."

But the qualifying term "infant" has been applied to cover a lack of knowledge of just how extensively flying has put on the robes of Big Business. The people who are most anxious to have aeronautics listed along with automobile manufacturing, railroading and shipbuilding appear, perhaps from the conservatism which has marked all of their actions, the least certain about the matter. They seem a trifle lost in the maze of production, marketing, advertising, operation and all of the other phases of fiscal detail which have suddenly engulfed what a few years ago was just a daring stunt indulged in by the foolhardy few who were reluctant to battle with their fellow men on the ground.

The confusion of the moment which has swept over aviation has bewildered even the prophets. Fearful of their reputations, they dare not call the shot. They move blindly through the flood of mergers, plans and projects not only uncertain about the outcome, but completely bewildered about the conditions as they exist at the moment. The prophet, along with the commercial flier, the war-time pilot who is wondering just how he is to fit into the picture, the manufacturer, the airline operator, the skilled laborer, the business man, the average citizen who is beginning to realize that he ought to find out something of the arguments of the biplane versus the monoplane and Junior who is neglecting his homework wondering how Lindbergh did it, is buffeted about between the rolling and often interlocking groups which, like worlds at the dawn of creation, are moving and jockeying blindly for just what positions they do not know.

The prophet should be forgiven for his temerity. Maybe it is something larger and greater than merely another industry. It deals with an element greater than all of the seven seas combined. I cannot forget the remark made at the recent aeronautics conference in Washington by Orville Wright to a brash reporter who wanted the aviation pioneer to dash off a prophecy on what the next twenty-five years would bring forth in aviation, and Mr. Wright's reply, "Young man, considering what has happened in the first twenty-five years of flying, it would be rather foolish to predict what may happen in the next quarter century." But one thing seems certain. The future will not take any definite shape until an outstanding figure emerges in aviation, a leader who will combine fundamental "air sense," the open-mindedness of inventive genius, with the broad-mindedness of great business. That figure does not seem to have appeared yet. Aviation today is passing through the pains of formation without his guiding hand.

Without assuming the responsibility of calling aviation a new business, a new industry, or something greater, I am presenting herewith facts revealed by an independent study of aircraft production in the United States today.

A comprehensive and general view reveals no small degree of confusion. Workers by the thousands in certain specified centers are being drawn into aircraft manufacturing. The old established trades which are being most

heavily taxed and which are in the greatest demand are interior decorating, carpentry, piano making, sail-making, fine metal working, automobile mechanics and cabinet making.

The fitting of all of these into factories to work side by side with temperamental inventors, efficiency experts, government inspectors, and business managers is responsible for a certain amount of the confusion in the plants which in the next eleven months conservatively are expected to produce some 10,000 new commercial ships.

At the outset the sudden attention of Wall Street to aviation cannot be overlooked. As this material is being prepared for AERO DIGEST, there comes the announcement of the organization of a new development and holding company which will place at the disposal of various aircraft projects a total capital of some \$200,000,000. And this is but the latest opening of the floodgates from Wall Street which is sluicing aviation with unlimited funds.

If all of the announced financing plans which have been made in recent months were as sound as this one, perhaps there would be not so much need for uneasiness. It will be readily admitted that it will take skillfulness and resourcefulness properly to administer such huge sums, particularly when it is realized that aviation is in the position of a starved patient suddenly confronted with unlimited supplies of food. And all of the projects are not as sound as this latest one. There have been not a few launched which seem to be engineered purely for the speculative interests involved, with the only profits expected being those which will accrue by the timely rising and falling of the stock market.

The effects of the opening of the floodgates from Wall Street upon aviation both today and tomorrow are such that they will affect in varying degrees pilots, airline operators, labor and the layman who is just coming into contact with aeronautics. It is because of this condition that in a survey of the aircraft industry we find today a small, conservative group which is trimming ship for a bad blow through which it seems inevitable that aviation must pass in the near future.

The storm which the leaders frankly admit is ahead will blow away a portion of the topheavy structure, but it will be for the most part only the temporary scaffolding of the structure which will go. For there is a hardness in the pioneering business of plane building which will endure.

The outside financial influence is at least likely to affect any shifting of the centers of plane production as they are now established in the United States. This manufacturing business is today located in definite geographical areas, and in these centers aviation is directly affecting banking and financial houses, the labor market and general industrial conditions, and in turn is affected by the viewpoint and attitude of the people residing in those areas.

There are three main sections or areas which are outstanding today for the amount of plane production which is going on within their arbitrary boundaries. The first is a central eastern section, in which the outstanding states are New York, New Jersey and Pennsylvania. From the



standpoint of dollars' worth of production, New York City, is the capital of this area. The second main section comprises Detroit and the rest of the Middle West, with Wichita, Kan., the capital or center. The third area is the far West, with the center the Pacific Coast. From a geographical standpoint, New England must now be reckoned with as an important aircraft production area, more, at the moment, for its possibilities than its performance. But with Hartford already established not only as a national but a world center of aircraft engine production, and Bridgeport developing rapidly, New England by no means can be left out of the picture. The absence of the South from the picture can only be greatly regretted. With unskilled labor plentiful, industrial property costs at a minimum and a great sufficiency of room in which to expand,

the southern states, it would seem, have failed to take advantage of a most obvious industrial opportunity. However, the spirit of aviation has long been alive in Texas, and leaders in Oklahoma have already begun to bestir themselves in a fashion which indicates much activity and eventual prosperity ahead.

We come first for consideration to the four-state area which includes the leading centers of New York City and Buffalo. In 1928, New York City dropped to second place in the number of commercial aircraft units produced, but in the valuation of the product it maintained its national leadership. When military work is included, the New York metropolitan area remains out in front of the field.

The slight loss in total production, however, is significant and is indicative of the trend of aircraft manufacturing



SOME OF THE AIRPLANES TO BE EXHIBITED AT THE ALL-AMERICAN AIRCRAFT SHOW, DETROIT



plants away from New York City for lower labor costs and lower industrial property costs.

The attitude of the average city dweller is in a large measure the cause of New York City's present wavering position. We do not find here the same intense interest by the layman in aviation that is to be noticed in other sections. The failure of the mass of people to come in close contact with actual plane operation, the fact that the city is only technically a terminus on the great transcontinental airway and on the international airway between Mexico City and Montreal, and the great distances to the flying fields which serve the city, are in the largest measure responsible for this condition.

But the question of whether the city's population becomes air-minded quickly or slowly can have only a small or

negligible effect in stemming the tide which is now set outward and which is carrying New York's air plants to other parts of the country. The chief causes of this movement are high industrial property costs and the high cost of skilled labor in the New York district.

But since these conditions existed at the founding of the new industry, one must seek elsewhere for the reason why New York City, almost overnight, became the leading center in the production of aircraft. Its advantages are as apparent as its drawbacks. The rail facilities for the transportation of raw materials are of the very best. The fact that these materials have to be purchased and assembled in only comparatively small quantities in the production of aircraft eliminated the need for large storage depots. And considering the costs mentioned before, one must remember that at the founding of these plants the entire industry was on a seller's market. It is only with the recent coming of stiff competition offered by new factories and the changing of the market to a certain extent that the disadvantages of the New York center have made themselves felt.

But these conditions to the contrary notwithstanding, it has been clearly demonstrated that an aircraft plant, efficiently operated, with a thoroughly tested and proved product and with a sound market, is able to operate without difficulty in the metropolitan district today.

Perhaps the Chance Vought Company in Long Island City, a corporate section of the city of New York, is the best example of this.

A glance at the fiscal record of this company tells an interesting and important part of the story of this organization. The company was organized on its present basis in 1922. In that year the total contract business was \$531,232. In 1928 the total value of planes produced and shipped was \$3,000,000. There were more than \$4,000,000 worth of unfilled orders on the books of this company on January 1 of this year. The total business of 1928 represented a 200 per cent increase over 1927, which is sixty per cent greater than the average increase of the entire industry.

Before passing to other factories in the New York metropolitan district a word must be said about the manner in which Chance Vought is handling the labor situation. Almost all of the labor is skilled and was originally drawn from trades of cabinet making, piano making, carpentry, metal workers of the automotive industry and die makers. The production charts of each department are closely watched and the efficient worker is given every opportunity to better his position. Apprentices are being drawn regularly from the trade schools. New engineering blood is also being drawn into the Vought factory from the leading engineering and aeronautical schools, such as the Massachusetts Institute of Technology, the Guggenheim School of Aeronautics of New York University, and the University of Michigan.

The Loening Aeronautical Engineering Company, established in 1917, is one of the companies which has demonstrated that it is possible to produce planes, not only within the corporate limits of the city of New York, but right in its busiest section, Manhattan. This company's plant employs an average of 200 workers, and the plant has a capacity for an annual production of \$2,000,000 worth of planes. In its history the company has built various types of planes, but now specializes in the Loening Amphibian. In the past, about eighty per cent of the production went to the Government, but recently the commercial and private market has been absorbing a portion.

In surveying the aircraft field, it becomes increasingly apparent that the company which has a regular Govern-



PLANES AT THE DETROIT AIRCRAFT SHOW



ment business, either with the Army or Navy, has an operating asset which cannot be improved upon. The Curtiss Aeroplane and Motor Company of Garden City, L. I., seems to have been one of the first to realize this. Here one finds a modern plant containing 130,000 square feet of floor space. This plant, consisting of a modern office building and several large one-story shops, is maintained almost exclusively for experimental work. This plant houses a staff of 168 technical men who are constantly engaged on designing planes.

The great modern plant of the Fairchild Aviation Corporation at Farmingdale, L. I., is perhaps the best example to be found in the New York district of the purely commercial aircraft plant. The Fairchild officers have developed at Farmingdale what is in every sense an aviation center, which includes a private flying field. The original plant has been increased today to 175,000 square feet, with individual units for machine production, small plane production, large plane production and a boat department. The Fairchild center employs 450 men and the output, now increasing in volume, has always been constant.

The Sikorsky Aviation Corporation is perhaps the best example of the large companies which are finding the disadvantages of the New York district too great for longer continuance. This company, which produces one of the outstanding amphibians of the world, is soon to give up its College Point plant, containing 40,000 square feet, and will move to Bridgeport, where both labor and industrial property costs are lower and where a factory containing 100,000 square feet of production space is available at a nominal cost.

In addition to these nationally known companies, there are several plants in the New York district which have done important aeronautical engineering and experimental work and which have turned out special aircraft jobs. The Ireland Aircraft, with 20,000 square feet of production space at Curtiss Field, and employing 50 men, and the Kirkham Products Company, which has 10,000 square feet at Garden City, and employs twenty men, are the outstanding organizations in the group.

It is due in no small measure to the contribution of Buffalo that New York State is able to maintain its lead in the matter of plane building. The interest of business leaders and civic organizations of Buffalo in the possibilities of the aircraft industry has had much to do with the success of the new industry in this center. Aviation is definitely accepted by business in Buffalo. The city has more than 1,500,000 square feet of productive factory space devoted to the building of planes and aircraft engines. More than 2,500 persons are employed today in making airplanes in this city.

Industrial property costs are comparatively low in the Buffalo district, although the agents of two or three aircraft companies now located elsewhere who have been scouting in this district for available factory sites declare they are not too easy to find, particularly if a location is being sought where property near the factory can be developed as a flying field.

Consolidated Aircraft is one large company in Buffalo which in the past has built purely for the military market, but which during the coming year plans to enter the commercial field. The large Consolidated flying boat, designed and built originally for the Navy, is to be adapted to commercial work. It will have a cruising range of 3,000 miles. The ship has a 100-foot wing span, a 60-foot hull and an 8-foot beam.

The Consolidated company has been engaged for six years building training planes for both the Army and the Navy. It has a completely modern factory, with a total

floor area of 105,000 square feet of production space. The factory is grouped in three building units with two separate engineering plants. It has a total personnel of 500 persons and is turning out planes at the rate of one a day.

The Hall Aluminum Aircraft Company is another of the aircraft organizations which one finds moderately housed in the Buffalo industrial center. Most of the personnel of both the engineering and production staffs of this company is engaged at the present time in producing a gigantic flying boat, which will be one of the largest of its kind ever built in this country. The first boat, now nearing completion, is a Navy contract job, for which Congress has appropriated \$70,000.

Since aircraft production in the Buffalo district dates back to the war-time industries, the labor conditions here



PLANES AT THE DETROIT AIRCRAFT SHOW



have had ample opportunity to settle and grow more or less fixed. The skilled labor costs are approximately 50 per cent cheaper here than they are in New York area. General Airplanes, Inc., one of the companies located in Buffalo, has undertaken the experiment of drawing a portion of its engineering staff directly from the automotive industry. Only men well-schooled in the automobile trades are being taken by this company at the present time, and they are being employed regardless of their knowledge of aeronautics. They are being sent to a special school organized by the company for these men for instruction in the theory of aerodynamics and plane designing. This company, builder of the Aristocrat, has one of its first planes included in the aircraft equipment of the Byrd Antarctic Expedition.

New Jersey is rapidly forging ahead among the states now leading in aviation activity. The state is co-leader in the country with Connecticut in the matter of aircraft engine operation. This leadership is due without question to the presence of the plant of the Wright Aeronautical Corporation, at Paterson.

The Wright factory, with a production force of 1,790 persons, is in every sense an aircraft organization fully grown. In method and procedure it differs little from a modern automobile engine plant, except for the extra care in machining which is necessary to maintain a high degree of safety of operation of the product in flight.

Next to the Wright plant, the second largest aircraft factory in New Jersey is that of the Aeromarine Klemm Company, at Keyport. Standard production work began at this plant on January 1. The available facilities permit the production of four planes a day.

It is in the states immediately south of New York that one finds the first effects of that migration which has started southward from the New York City industrial center.

The first example of a plant which recently has changed its location is that of the Bellanca Aircraft Company, formerly on Staten Island and now located at New Castle on the outskirts of Wilmington, Del.

"The particular advantage which we find in being out and away from a big city like New York," said Mr. Bellanca, "is that labor here is much more stable."

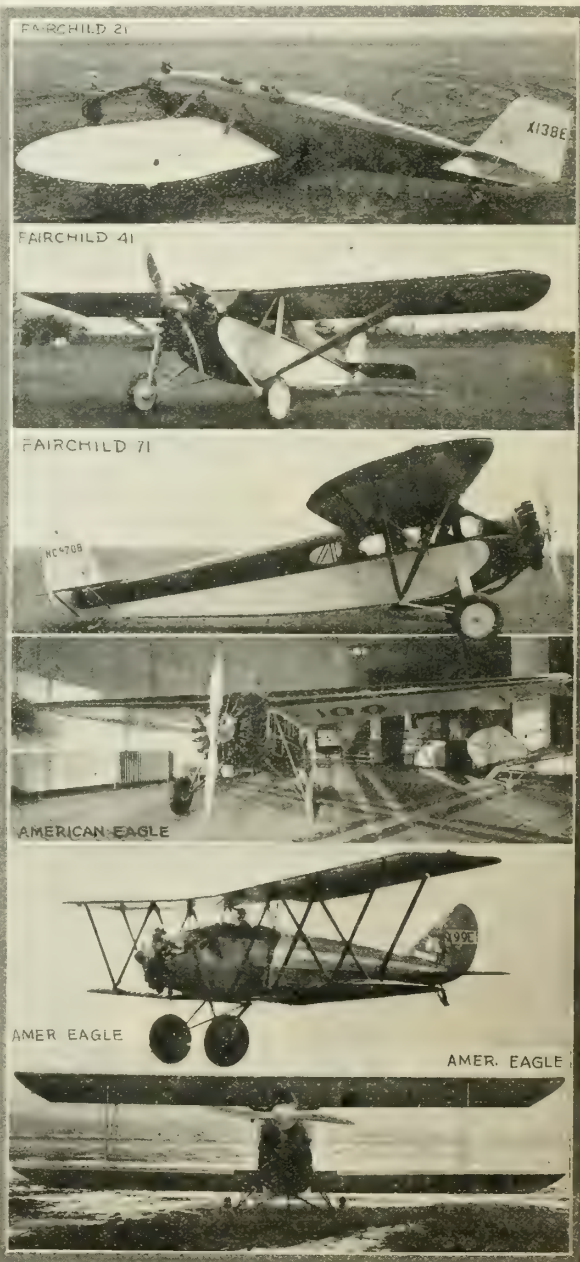
The Bellanca company is now located on a site which the company owns and which is being developed into a unique air center. The factory originally occupied six months ago, contained 20,000 square feet. New building work, which is now nearing completion will add 30,000 square feet of factory space. A fine flying field, which is located directly on the airway between Montreal, New York, Miami and Central America, is owned by the company and, in the near future, will be lighted for night flying. The plant employs 175 workers on a six day week basis, and according to plans, will produce about 250 planes of the CH type in 1929.

The Pitcairn aviation interests are a dominating influence in aviation activities in Pennsylvania. Pitcairn Aviation, Inc., and Pitcairn Aircraft, Inc., of Philadelphia, are two organizations which represent the successful linking of airplane operation with aircraft production. Fundamentally an airline operating organization and operator of the air mail system between New York and Atlanta and Atlanta and Miami, this company entered the field of manufacturing in order to have a plane particularly adapted to do the air mail work undertaken. A plant was established at Bryn Athyn, Pa. This factory, which has a total production area of 12,000 square feet, produces the famous Pitcairn Mailwing plane. The bulk of the planes have been

going in Pitcairn operations. In 1928 the surplus of the factory, though small, was released to the general market, and this proved so successful that the Pitcairn company is definitely committed to a production program.

The Keystone Aircraft Company is another nationally known organization contributing to Pennsylvania's yearly plane output. This company, which has a modern hangar factory at Bristol, Pa., has made most of the bombers for the Army during the past two years. Now firmly established and incorporated as a unit in one of the larger aviation corporation groups, the company is entering the commercial field as the producer of giant airliners. The first of these, the Keystone Patrician, one of the biggest planes of its kind in the world, was recently completed.

The Kreider-Reisner factory at Hagerstown is the



PLANES AT THE DETROIT AIRCRAFT SHOW



leader in Maryland in aircraft production. This company has made rapid strides, and its plant is an example of sound development and thorough management.

Before the recent reorganization of the Fokker Aircraft Corporation, the disadvantages of a main plant in the New York metropolitan district had become apparent. Moving south for cheaper labor, the company selected a site at Glendale, near Wheeling, W. Va. A modern factory of more than 80,000 square feet is now completed in this city, where the development has created much interest and has gathered to it a vital amount of civic interest.

Aviation, which for many years was slow in taking hold in New England, is now going forward in this section with pleasing rapidity. Leaders in aeronautics are beginning to realize the industrial advantages of this section, and the

large supply of factories and low labor costs present a condition which cannot be ignored. The Moth Aircraft Corporation is now establishing its factory at South Lowell, Mass., and the Whittelsey Manufacturing Co., which has the American rights for the Avro Avian, has selected Bridgeport for its production center.

These and other companies contemplating the New England field have the Pratt & Whitney Aircraft Company as a precedent of what can be achieved in this district. The strength which this company has contributed to the other units of the center is typical of what aviation is doing and can do for the older and weaker industries of New England.

Although this aircraft plant has been in operation only since 1926, the factory, with a productive floor area of 200,000 square feet, is running at capacity. The total employment is 900 persons, of whom approximately 99 per cent are skilled. The company is following the policy of taking a small number of apprentices to the machine trade into the plant, and here as elsewhere there is a tremendous amount of enthusiasm among young workers to get into aviation production work. The expected production of the plant for 1929 is 2,000 engines.

All aviation activity in the Middle West seems to have an enduring hardiness and a basic quality of substantialness which cannot be denied. The two leading cities in the amount of production activity are Detroit and Wichita, Kan.

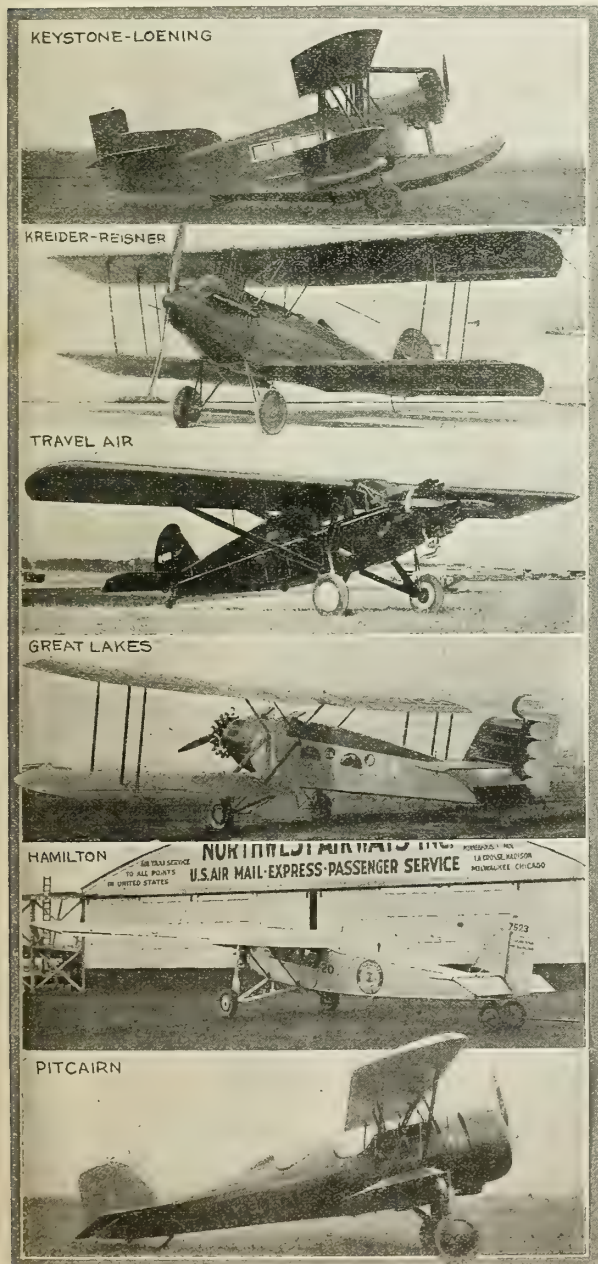
In this section one finds a deep faith in aviation held by the business man and the average citizen. The remark was made to the writer by a city hall figure in Detroit, "The people in this city will vote for anything which has to do with the promotion of aviation."

The business leaders of Detroit have taken hold of aviation promotion with great enthusiasm, and it is noticeable that their plans are not so much concerned with immediate returns as with a solid and substantial future. They argue that the same industrial conditions which made Detroit the logical automobile center of the country will be the effective magnet in drawing a satisfactory volume of the aircraft production business of the future. This background in which Detroit takes so much stock is indeed formidable. It consists of some twenty-three nationally known manufacturers who today are producing one or more products which are directly used in plane or aircraft engine production.

The entrance of Henry Ford into the field of aviation has had much to do with the switching of the weight of great confidence to aviation in this outstanding automobile center. The Stout Aviation Division of the Ford Motor Company is one of the most remarkable big ship plants in the country. Here in this modern and model plant, one finds that the production efficiency of the automobile plant, which is the goal of so many plane producers today, has been achieved to a remarkable degree. One complete ship is being rolled from the production floor as a finished product every two working days.

The Stinson Aircraft factory, the second large plane plant well within the corporate limits of Detroit, for some time has been suffering from this handicap through an inability for further expansion at its present site. The increasing market for this ship has placed great demands on the original plant, which has capacity for not more than one plane a day, a limit which was reached some time ago.

It is for this reason that the Stinson company will be one of the first organizations which will locate at the new commercial aircraft center now being developed at Wayne. This center, the result of the initiative of a group of Detroit business leaders, will be located seventeen miles



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from the heart of the city and is to be developed around a purely industrial flying field, from which all civilian planes and airline ships are to be excluded. Each manufacturer locating on the site will have the use of the field as a testing ground at a nominal annual rental.

The Buhl Aircraft Company, with its plant located at Marysville, has escaped the handicap of developing in a city where surrounding industrial conditions limit expansion. No small measure of the unique success which this well managed company has enjoyed is due to the fact that the original setting of its plant afforded ample opportunity for development as it was required in the production of the Buhl Airedale, which has become a nationally known ship.

Ohio was the third state in the list of the largest aircraft producers in 1928. This position was due largely to the activity of the Advance Aircraft Company at Troy. This firm, which started business more than seven years ago, was one of the first to achieve fast assembly methods. The national fame of the Waco is the result. Production in the Troy plant for some time has been twenty-five planes a week. The design is simple and one that lends itself readily to standard production.

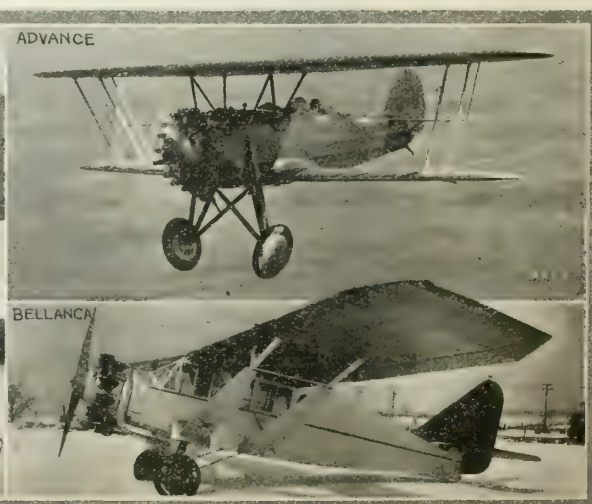
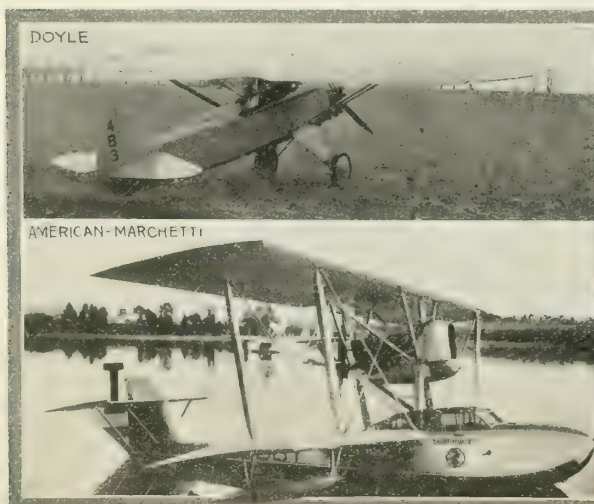
Illinois is developing rapidly as an important aircraft production state. Last year its position was seventh in the nation list. The Mono-Aircraft, builder of the Monocoupe, was the leading contributor to this state's impressive total. The company, with a modern factory at Moline, has gotten production and assembly down to about as fast a clip as will be found anywhere in the industry, and the output for the year should be close to 1,000 planes.

In plane output, Missouri ranks next to Ohio. A total of 816 planes were produced in the plants of this state during the past year. Aircraft activity in this state is showing a tendency to group itself around St. Louis, where financial leaders and bankers have taken much interest in aviation promotion.

About \$3,000,000 worth of aviation construction for plane manufacturing has been done in the St. Louis district and most of this investment has been made on the site of Lambert Field. St. Louis has the new plant of the Mahoney-Ryan company, the Parks Aircraft, Inc., and the Cardinal Aircraft which is a subsidiary of the St. Louis Car Company. Perhaps the most formidable organization in this locality is the Curtiss-Robertson Airplane Manufacturing Company. A modern plant for fast assembly of the

Curtiss-Robin has been finished for the production of this three-seat commercial cabin monoplane—a bid to establish a new type in the small sport plane class of ships.

One of the largest plants contributing to the Missouri



SOME OF THE AIRPLANES TO BE EXHIBITED AT THE ALL-AMERICAN AIRCRAFT SHOW, DETROIT



state total, but outside the St. Louis area, is the American Eagle Aircraft Corporation at Fairfax Airport, Kansas City. A new modern plant adjoining the present factory, in which more than 500 planes were turned out last year,

is now ready for occupancy. In addition to producing a full line of plane types, the American Eagle company is now planning to enter the engine field and has taken over the manufacturing rights to the Hudson Hawk six-cylinder radial motor.

But the claims of other cities to the contrary notwithstanding, Wichita appears to be the air center of this section, and is consistently proving it with production figures. Wichita led all of the rest of the country in the number of planes manufactured last year. The total was 927 planes, and this leadership was only exceeded by New York when the latter city's production is translated into a total valuation figure. The New York gross airplane value was \$7,500,000, and that of Wichita, approximately \$3,000,000.

The rise of Wichita to a position of first importance in aircraft manufacturing is not so much accident as the combination of natural advantages, pioneering spirit and the determination of its business leaders to develop and maintain control of the plants.

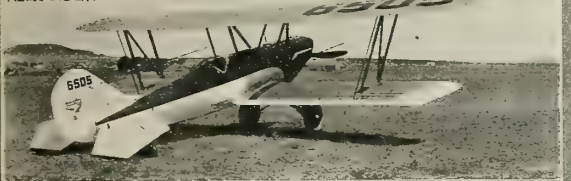
There are six commercial airplane factories here, four of which have been in mass production for some time, one of which has achieved the fastest assembly in the United States, and one of which employs a night crew, production continuing twenty-four hours a day. The combined plants will produce in excess of 2,000 planes this year, or approximately one-fourth of the country's commercial plane output.

The Swallow Aircraft is the oldest of the organizations in this center, and it is from this company that the other plants stem more or less directly. The thoroughness, the precision and the businesslike air which one notices in the Stearman biplane all seem to be attributes which are drawn directly from the plant in which the Stearman ships are being produced. Conservatism marks the executives of this company, and the prediction that the factory, formerly an automobile plant which has been well adapted to the work in hand, will produce 150 planes this year seems likely will be an error on the side of conservatism.

Perhaps the most striking thing about the Wichita field is that the aircraft business in this center does not rest on the "sure thing" of a military market. And there are no large transport planes built here. All of the plants are specializing in general medium-sized, work-a-day planes, a continuous and increasing output of which presumes that flying public will increase indefinitely.

The Travel Air Manufacturing Company, under the able

ALEXANDER



"FLAMINGO"



PARAMOUNT



IRELAND



MOTH



SIMPLEX



REARWIN



KNOLL



VERVILLE

SOME OF THE AIRPLANES TO BE EXHIBITED AT THE ALL-AMERICAN AIRCRAFT SHOW, DETROIT



direction of Walter Beach, is being managed on the general theory of an ever-increasing market for a wide range of plane types. A close approximation to the moving progressive assembly line of the modern automobile factory has been achieved in this plant, which for some time past has been turning out an average of twenty-eight planes a week.

All of the companies here are engaged in new building programs to care for necessary expansion in production. The Swift Aircraft Corporation is constructing a modern factory, and the Knoll Aircraft Company, now just getting under way, is finishing a new factory at a cost of \$120,000.

The planes made in Wichita are about equally divided between monoplanes and biplanes. This fact is mentioned for the reason that nowhere has the technical argument regarding the virtues of these two types raged so hotly as in Wichita. This argument was responsible for the founding of a company by C. V. Cessna. The Cessna Aircraft Company today produces a monoplane which has established a number of recent records for speed.

Down in Tulsa, Oklahoma, the Spartan Aircraft Company has grown to be one of the leading manufacturing companies in that section of the country. They produce a 3-place open cockpit biplane which has met with high favor.

On the Pacific Coast, as perhaps nowhere else, has flying been accepted as an every day occurrence by the largest portion of the general public. But although one finds no outstanding centers west of Wichita until one reaches California, there are significant aviation activities in the states between. The showing of Colorado cannot be ignored. This state produced \$750,000 worth of planes in 1928 and was in sixth place among the leading production states, this total having been largely due to the output of the Alexander Eaglerock factory.

The factories and real estate value of the Alexander Industries, Inc., devoted to the manufacture of airplanes is nearly \$281,000. The factories were originally located at Denver. J. Don Alexander is one of the best known figures in the aeronautical industry and the success of his company is attributed in no small measure to his intense interest and belief in the industry to which he devotes so much of his energy. The total income from the sale of Eaglerock airplanes last year amounted to something like \$2,500,000.

Los Angeles is now the sectional center of the new in-

dustry on the Pacific Coast. There are five nationally known aircraft companies located within the city's metropolitan area. There are seven additional factories located in the southern field and the total of these twelve produced the bulk of the \$1,500,000 worth of planes which were turned out in California last year.

The chief factories located in Los Angeles County are the Douglas Aircraft Company, Lockheed, Kinner, Golden Eagle and Bach. Of these the largest and best known, perhaps, is Douglas.

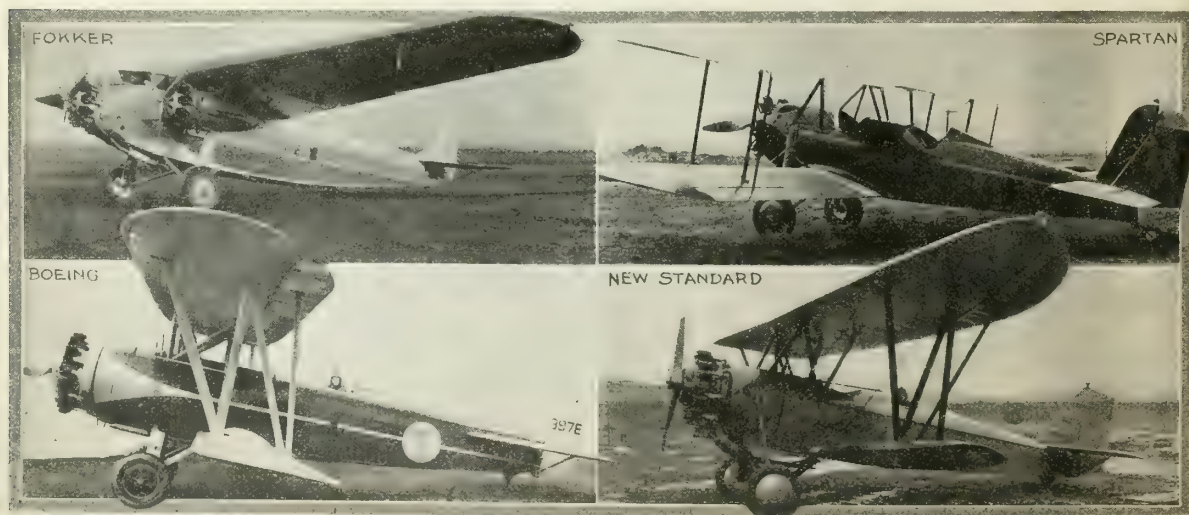
The Douglas company started operations as a partnership in 1920, with a borrowed capital of \$15,000 and in a leased plant. Today it has grown to one of the leading builders of planes, with a planned production this year of \$4,000,000. At the opening of the year, there was a total of \$2,900,000 worth of orders on the company's books.

The Bach Aircraft Company is one of the recently born organizations, which seems to have gotten away to a good start. The Kinner Airplane & Motor Corporation's motor plant at Glendale is typical of the best and most competently managed organizations of the industry. The Lockheed Aircraft Company, which went forward with a rush in the closing months of last year, has gained great fame from the transcontinental flights of Goebel and Hawks.

Outside of Los Angeles, there are three other centers of aviation activity on the Pacific Coast. They are Seattle, San Diego and San Francisco. In the total number of plane and engine factories, San Francisco is the leader in this group, but Seattle is unique by the virtue of the Boeing aircraft factory, and one will travel far before one finds a more remarkable or more thoroughly developed organization than that represented by Boeing.

The modern factory of this company has become a by-word in the industry. Its methods in producing the Boeing mail planes, the Boeing fighters and more recently the large passenger transport, have been the object of pilgrimages of producing engineers from all parts of the country and presage a soundness for the future of aviation which is highly reassuring.

The inevitable conclusion to be drawn from such a survey as this is that aviation has taken a rightfully important place among the nation's established and recognized industries. Even the skeptic is beginning to admit the potentialities of the science of flight; as for the industrial growth of aviation,—the statistics cannot be denied.



SOME OF THE AIRPLANES TO BE EXHIBITED AT THE ALL-AMERICAN AIRCRAFT SHOW



# AIR—HOT AND OTHERWISE

**T**HIS has been a month to become excited over. Those really interested in aviation, rather than in aviation politics, have reasons for that comfortable feeling. It has been a month of faultless flight without a single crack up as far as actual progress goes.

As soon as Hoover finished his first-class, A-1 cabinet-making job, he reappointed Admiral Moffett for his third term. My soul is filled with interested inquiries as to how our old friends Admirals Hughes and Lee feel about this matter, and as to what ex-Secretary Warner has to say about it to himself, and his special God, when he kneels down to pray at night.

Washington's Pennsylvania avenue is broad. What means that frightened, yelping, moving, even scuttling, mass which I see fading into haze of distance as I peer along this great, historic path? Ah, yes! It's made up of the anti-aircraft dogs. What do they fear? They fear that Moffett's reappointment means their game really is up.

Admiral Moffett got this job eight years ago when first it was created. Since that time naval aeronautics have forged ahead too rapidly to suit the bureaucrats who, from the start, endeavored to make his task as hard as possible. A mistake. They know it, now. The Admiral likes hard jobs best of all, and does them best of all.

To run the bureau would have been a big man's job even if he had had intelligence and coöperation around him. To do it, when he had around him ignorance and stealthy crookedness, naturally was a little harder. But Moffett is not merely a Big Man, he is a Bigger Man. He has strategically, and in every other sense, defeated (as air-mindedness always will defeat its opponents) the whole pack, including its quondam leader. Wilful Wilbur is now licked, knocked out, walloped, in other words defeated, and Moffett is on the job, ready to give this nation four years more of 100 per cent service. This is a Prohibition country, Admiral, but I know a bank where the wild thyme grows. It's almost as good as mint. And here's to you, Admiral, in a toast which everyone in aeronautics, the industry, the operations end and all the by-lines, side-lines and accessory interests will join me in consuming with a pleasant smile.

What a further shock must have been administered to that pack when President Hoover announced the appoint-

*Moffett Wins*

*Warner Out!*

*Ingalls In!*

*Furlow Bill Sandbagged*

**By Frank A. Tichenor**

tests, he flies himself. He does not ask another man to take the risks.

How good Admiral Moffett must feel now that in this man he has a chief who positively will back him up! With this team operating in the interests of naval aircraft, much that is good is bound to happen. My advice to Hughes and Lee, and all the others of their type, is to ask the new Secretary of the Navy to send them forth with out to Guam (pronounced Gwam, which is very much like g'wan) where it has been the custom to send

anyone in our great Navy who had wit enough to say a good word about flying. These episodes, to some extent, repay us for what we suffered under Wilful Wilbur and his now retreating pack.

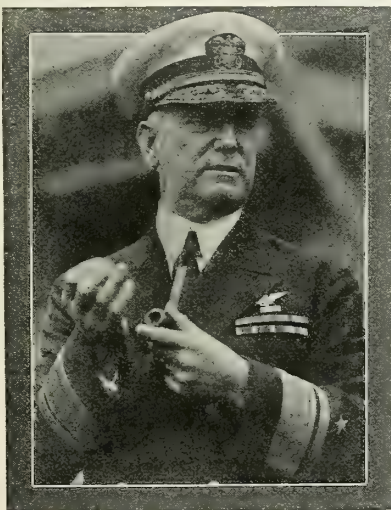
**M**OST of those who will read this have read, also, the announcement in the nation's newspapers of the flotation of The Aviation Corporation. This \$200,000,000

holding company, with a board of directors strong enough to take over the financial kudos of the Bank of England (if it wanted it), is something to make everyone in aviation grin widely with delight. On the list will be found presidents of railways, presidents of banking corporations and other men of great financial eminence. The money-wisest individuals in all the world are getting into line with aviation.

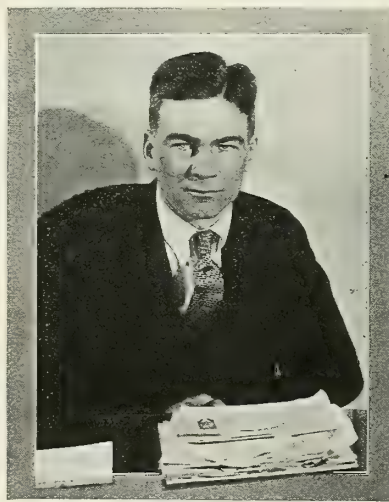
It is impossible to over-estimate the importance and the glory of the impulse indicated by this company's formation, and in an early issue, in which we shall be able to give the subject the real space to which it is definitely entitled, we shall tell the splendid drama of which Sherman Fairchild is a leading character.

The tale is as astounding and dramatic as that of aviation, itself.

**W**HEN Congress adjourned at noon, March 4th, the Furlow Bill died with it. With that bill died also the immediate hopes of all the members of the Army Air Corps for fair treatment (Continued on page 252)



**Admiral William A. Moffett**



**Assistant Secretary David S. Ingalls**



# INDEX OF ADVERTISED AERONAUTICAL PRODUCTS

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[ have been advertised in AERO DIGEST during the past year. ]

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Keystone Aircraft Corp.....Bristol, Pa.  
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Stearman Aircraft Co.....Wichita, Kan.  
Stinson Aircraft Corp.....Northville, Mich.  
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Roebbling's Sons Co., John A.....  
Trenton, N. J.

## CAMERAS (AERIAL)

Fairchild Aerial Camera Corp.....N. Y. C.  
Fort, Henry K.....  
Widener Bldg., Philadelphia, Pa.

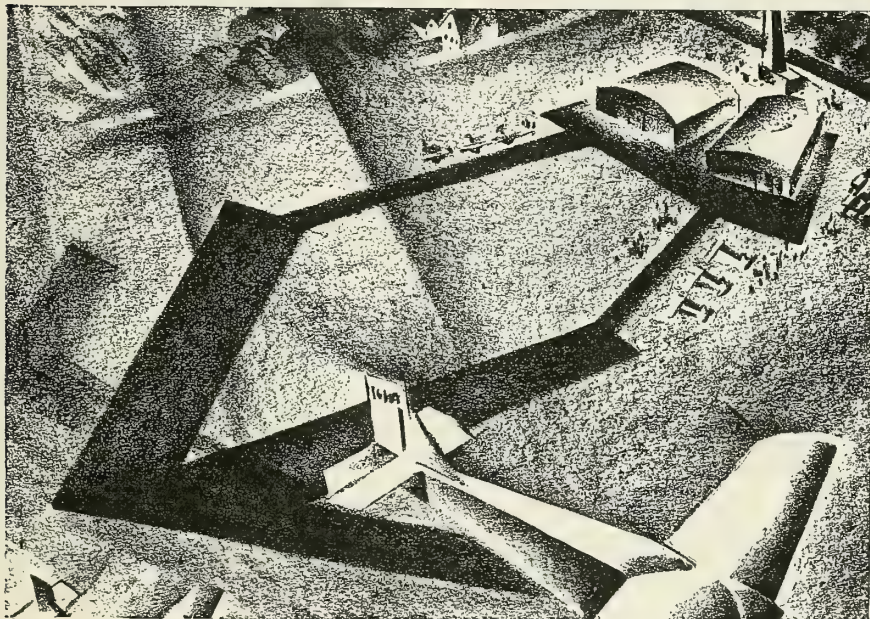
## CHEMICALS

California Compressed Gas Co.....  
2305 E. 52nd St., Los Angeles, Cal.  
International Oxygen Co.....Newark, N. J.

## CLOTHING and EQUIPMENT

Air Transport Equipment, Inc.....  
Curtiss Field, Garden City, N. Y.  
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68 E. 131st St., N. Y. C.  
Becker's, 159-06 Jamaica Ave., Jamaica, N. Y.  
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Gordon & Ferguson, Inc., St. Paul, Minn.  
Lee Mercantile Co., H. D., Kansas City, Mo.  
Meyrowitz, Inc., E. B.....  
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622 Market St., Philadelphia, Pa.  
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 Scully Brothers, Inc. .... Los Angeles, Cal.  
 Sidney's Aviation Sales. .... 1024 Mission St., San Francisco, Cal.  
 Spalding & Bros., A. G. .... 105 Nassau St., N. Y. C.  
 Strauss & Buegeleisen. .... 30 Front St., Brooklyn, N. Y.  
 Utility Garment Corp. .... 138 So. 9th St., Philadelphia, Pa.  
 West Coast Aviation Service. .... Lowe Bldg., Long Beach, Cal.  
 Wilson Products, Inc. .... Reading, Pa.  
 Worumbo Co. .... 334 Fourth Ave., N. Y. C.

## DISTRIBUTORS (See SCHOOLS AND DISTRIBUTORS)

## DRAIN PIPE

Armco Culvert Mfrs. Assn. .... Middletown, Ohio  
 "Poroswall" Rapid Drain Pipe. .... Little Ferry, N. J.

## ELECTRO PLATING

Keystone Electric Plating Co., Inc. .... 14th St. & Van Alst Ave., L. I. C., N. Y.

## ENGINE MANUFACTURERS

Aeromarine Klemm Corp. .... Paramount Bldg., N. Y. C.  
 Aeronautical Products Corp. .... Naugatuck, Conn.  
 Aircraft Engine Co. .... 1709 E. 12th St., Oakland, Cal.  
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 Brownback Motor Laboratories, Inc. .... 420 Lexington Ave., N. Y. C.  
 Dayton Airplane Engine Co. .... Leo St. & B. & O. R. R., Dayton, Ohio  
 Fairchild Camenz Engine Corp. .... Farmingdale, L. I., N. Y.  
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 Kimball Aircraft Corp. .... Naugatuck, Conn.  
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 Pratt & Whitney Aircraft Co. .... Hartford, Conn.  
 Rocky Mt. Steel Products, Inc. .... 1346 Wall St., Los Angeles, Cal.  
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 Tips & Smith, Inc. .... P. O. Box 153, Houston, Tex.  
 Velie Motors Corp. .... Moline, Ill.  
 Warner Aircraft Corp. .... Detroit, Mich.  
 Wright Aeronautical Corp. .... Paterson, N. J.

## ENGINEERS and DESIGNERS

Aero Engineering & Advisory Service, Inc. .... Chanin Bldg., N. Y. C.  
 Aerotech, Inc. .... Moline, Ill.  
 Booth, Harry T. .... Westbury, L. I., N. Y.  
 Danne, Harold A. .... 41 Park Row, N. Y. C.  
 Gilbo-Gilbo Aeronautic Engineers. .... 412 Arlington Pl., Stevens Point, Wis.  
 Harris, Lee Hurdman. .... Bright Water, Long Island, N. Y.  
 International Engineering Corp. .... Westory Bldg., Washington, D. C.  
 Mallon Company, Inc., Wm. H. .... 420 Lexington Ave., N. Y. C.  
 Van Deventer, Inc., H. R. .... 342 Madison Ave., N. Y. C.

## ENGINE PARTS and ACCESSORIES

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 B. G. Corp. .... 136 W. 52nd St., N. Y. C.  
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 Cox & Sons, John S. .... Terre Haute, Ind.  
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 Miller Airplane Products. .... 3827 W. Jefferson, Los Angeles, Cal.  
 Millers Machine & Repair Shop. .... Lake Mills, Iowa  
 Mosler Ignition Co. .... 30 University Pl., N. Y. C.  
 Norma-Hoffman Bearings Corp. .... Stamford, Conn.  
 Ohio Crankshaft Co. .... Cleveland, Ohio  
 Pacific Aero Motors Corp. .... 3417 Angeles Mesa Dr., Los Angeles, Cal.  
 Rippley Mfg. Co. .... Wayne, Mich.  
 SKF Industries, Inc. .... 40 E. 34th St., N. Y. C.  
 Scintilla Magneto Co., Inc. .... Sidney, N. Y.  
 Stromberg Motor Devices Co. .... 58-63 E. 25th St., Chicago, Ill.  
 Tank, F. C. .... 275 First Ave., Milwaukee, Wis.  
 Thompson Products, Inc. .... Cleveland, Ohio  
 Troop Auto Radiator Co., Martin. .... 1215 Boulevard, Bayonne, N. J.  
 U. S. Hammered Piston Ring Co. .... Irvington, N. J.  
 Vellumoid Co. .... Worcester, Mass.  
 Vimalert Co., Ltd. .... 807 Garfield Ave., Jersey City, N. J.  
 Wilson Co., H. A. .... 97 Chestnut St., Newark, N. J.

## EXPORTERS

Ad Auriema, Inc. .... 117 Broad St., N. Y. C.

## FABRIC

Thurston, W. Harris. .... 40 Worth St., N. Y. C.  
 Twining & Co., E. S. .... 620 Broadway, N. Y. C.

## FINANCIAL

Aagaard & Co., W. S. .... 208 So. La Salle St., Chicago, Ill.  
 Aeronautical Industries, Inc. .... 292 Madison Ave., N. Y. C.  
 Aviation Corp. .... 16 William St., N. Y. C.  
 Aviation Financing & Trading. .... 231 So. La Salle St., Chicago, Ill.  
 Commercial Credit Companies. .... Baltimore, Md.

Durante & Co., Inc., A. A. .... 117 Liberty St., N. Y. C.  
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 Murphy Co., J. Myron. .... 43 Exchange Pl., N. Y. C.  
 Prosser Co., J. Roy. .... 52 William St., N. Y. C.  
 Pyncheon & Co. .... 111 Broadway, N. Y. C.  
 Reynard, L. .... 89 Broad St., N. Y. C.  
 Ward, Wells & Dreshman. .... 475 Fifth Ave., N. Y. C.

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 Pyrene Mfg. Co. .... Newark, N. J.

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 Hamilton Company. .... Milwaukee, Wisc.

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 Meyrowitz, Inc., E. B. .... 520 Fifth Ave., N. Y. C.  
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 Willson Products, Inc. .... Reading, Pa.

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## HOTELS

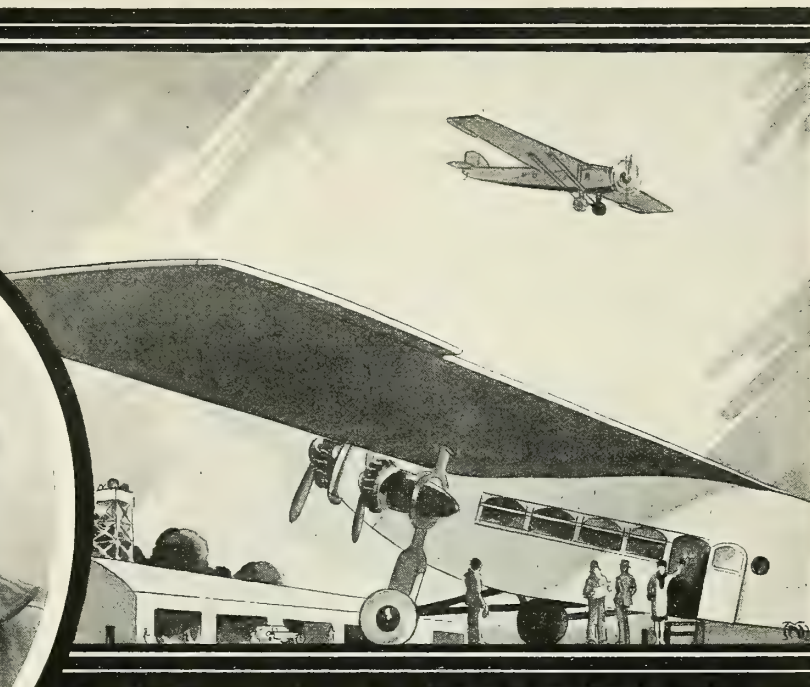
Hotel Alexandria. .... Fifth & Spring Sts., Los Angeles, Cal.  
 Drake Hotel, The. .... Chicago, Ill.  
 Hotel Fort Shelby. .... Lafayette & First, Detroit, Mich.

## INSIGNIA, ETC.

Ace Badge, Button & Medal Co. .... 305 Fifth Ave., N. Y. C.  
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Barbour-Stockwell Co. .... *Cambridge, Mass.*  
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 Cramer & Co., R. W. ....  
 136 Liberty St., N. Y. C.  
 Elgin National Watch Co. .... *Elgin, Ill.*  
 Fischer Spring Co., Chas. ....  
 240 Kent Ave., Brooklyn, N. Y.  
 Jaeger Watch Co., Inc. ....  
 36 W. 47th St., N. Y. C.  
 Motometer Co., Inc., The. ....  
 1 Wilbur Ave., Long Island City, N. Y.  
 Pioneer Instrument Co. ....  
 754 Lexington Ave., Brooklyn, N. Y.  
 Rieker Instrument Co. ....  
 1919 Fairmount Ave., Philadelphia, Pa.  
 Ritchie & Sons, E. S. ....  
 112 Cypress St., Brookline, Mass.  
 Star Compass Co., Inc. .... *Boston, Mass.*  
 White Dental Mfg. Co., S. S. ....  
 152 West 42nd St., N. Y. C.

## INSULATION (CABIN)

Dry-Zero Corp. ....  
 130 No. Wells St., Chicago, Ill.  
 Wood Conversion Co. .... *Cloquet, Minn.*

## INSURANCE

Barber & Baldwin, Inc. ....  
 Graybar Bldg., N. Y. C.  
 Crowder, Walter C. ....  
 202 So. State St., Chicago, Ill.  
 Independence Companies, The. .... *Phila., Pa.*  
 Transportation Indemnity Co. ....  
 1 So. William St., N. Y. C.  
 U. S. Aviation Underwriters, Inc. ....  
 80 John St., N. Y. C.

## LIGHTS

B. B. T. Corp. of America. ....  
 Atlantic Bldg., Philadelphia, Pa.  
 General Electric Co. .... *Schenectady, N. Y.*  
 Westinghouse Electric & Mfg. Co. ....  
 South Bend, Ind.

## LUMBER

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 1246 Grand St., Brooklyn, N. Y.  
 Dykes Lumber Co. .... 137 W. 24th St., N. Y. C.  
 Pike-Dial Lumber Co. ....  
 2251 So. Loomis, Chicago, Ill.  
 Posey Co., J. V. G. ....  
 Public Service Bldg., Portland, Ore.  
 Shepard & Sons, H. G. .... *New Haven, Conn.*  
 Yoho & Hooker Lumber Co. ....  
 520 Williamson Ave., Youngstown, Ohio

MACHINERY (See TOOLS,  
HARDWARE, MACHINERY)

## METALS

Aluminum Co. of America. ....  
 2484 Oliver Bldg., Pittsburgh, Pa.  
 American Rolling Mill Co. ....  
 Middletown, Ohio  
 Bohn Aluminum & Brass Corp. ....  
 Detroit, Mich.  
 International Nickel Co., Inc. ....  
 67 Wall St., N. Y. C.

## MODELS

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 Aero Model Co. ....  
 329 Plymouth Court, Chicago, Ill.  
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 Home Instructor Co. ....  
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 Michigan Model Airplane Supply Co. ....  
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 Mt. Carmel Mfg. Co. .... *New Haven, Conn.*  
 Pouch, K. A. ....  
 83 Low Terrace, New Brighton, N. Y.  
 U. S. Model Aircraft Corp. ....  
 341a Monroe St., Brooklyn, N. Y.  
 Wright Mfg. Co. ....  
 47 So. 12th Ave., Mt. Vernon, N. Y.

## OILS AND GASOLINE

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 Clark, Inc., Fred G. .... *Cleveland, Ohio*  
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 Naturaline Co. of America. .... *Tulsa, Okla.*  
 Pennzoil Co. .... *Oil City, Pa.*  
 Phillips Petroleum Co. .... *Bartlesville, Okla.*  
 Quaker State Oil Refining Co. .... *Oil City, Pa.*  
 Richfield Oil Co. .... *Richfield, Cal.*  
 Standard Oil Co. of Cal. .... *San Francisco, Cal.*  
 Standard Oil Co. of Ind. .... *Chicago, Ill.*  
 Standard Oil Co. of New York. .... *N. Y. C.*  
 Texas-Pacific Coal & Oil Co. ....  
 Fort Worth, Tex.

Tidewater Oil Sales Corp. .... *N. Y. C.*  
 Union Oil Co. .... *Los Angeles, Cal.*  
 Vacuum Oil Co. .... 61 Broadway, N. Y. C.  
 Wolverine Lubricants Co. ....  
 225 West 34th St., N. Y. C.

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LACQUERS

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 Berry Brothers, Inc. .... *Detroit, Mich.*  
 Brooklyn Varnish Mfg. Co. ....  
 35 Nostrand Ave., Brooklyn, N. Y.  
 du Pont de Nemours & Co., Inc., E. I. ....  
 Parlin, N. J.  
 Murphy Varnish Co. ....  
 224 McWhorter St., Newark, N. J.  
 Perry Austen Mfg. Co. ....  
 Grasmere, Staten Island, N. Y.  
 Phenix Aircraft Products Co. ....  
 Williamsville, N. Y.  
 Smith Co., Ed. .... *Long Island City, N. Y.*  
 Titanine, Inc. .... *Union, Union County, N. J.*  
 Valentine & Co. .... 386 Fourth Ave., N. Y. C.  
 Wailes Dove-Hermiston Corp. ....  
 17 Battery Place, N. Y. C.

## PARACHUTES

Brevetti Aeronautici, S. A. ....  
 Via in Lucina 15, Rome, Italy  
 Follmer-Clogg Co. .... *Lancaster, Pa.*  
 Henning Parachute Co. ....  
 3926 Bryant Ave., N. Minneapolis, Minn.  
 Irving Air Chute Co., Inc. ....  
 372 Pearl St., Buffalo, N. Y.  
 Russell Parachute Co. ....  
 1202 Kuttner Blvd., San Diego, Cal.  
 Welsh, Co., C. ....  
 R. 10 Crofton Sta., Pittsburgh, Pa.

## PATENT ATTORNEYS

Burnham, Royal E. ....  
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 Dieterich, Albert E. ....  
 Ouray Bldg., Washington, D. C.  
 Evans & Co., Victor J. ....  
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 Jacobs, Albert L. ....  
 721 Barrister Bldg., Washington, D. C.  
 Lancaster & Allwine. ....  
 Ouray Bldg., Washington, D. C.  
 O'Brien, Clarence A. ....  
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 Polachek, Z. H. .... 1234 Broadway, N. Y. C.  
 Snow & Co., C. A. ....  
 717 8th St., Washington, D. C.

## PAVING MATERIAL

Barber Asphalt Co. .... *Philadelphia, Pa.*  
 Barrett Co. .... 40 Rector St., N. Y. C.

## PHOTOGRAPHERS

Davis, John Adams. ....  
 461 Eighth Ave., N. Y. C.  
 Erickson, H. A. ....  
 68 Sefton Block, San Diego, Cal.

## PLANS AND PARTS

Crawford Airplane Manufactory. ....  
 Seal Beach, Cal.  
 Hawthorne Model Aero Co. ....  
 Hawthorne, N. J.  
 Orion Aircraft Co. ....  
 Box 13 Hawthorne, N. J.  
 San Diego Airplane Co. .... *San Diego, Cal.*  
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 3706 49th St., San Diego, Cal.  
 Smith, Ronald, L. J. ....  
 1247 Loma Vista Drive, Long Beach, Cal.  
 Storms Aviation Co. .... *Spartanburg, S. C.*  
 Universal Aircraft Co. ....  
 936 W. 60th St., Los Angeles, Cal.  
 Vance Aircraft Co. .... *Mendota, Cal.*

## PLYWOOD

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 Haskelite Mfg. Corp. ....  
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 N. J. Veneer Co. .... *Paterson, N. J.*  
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 White Brothers. ....  
 5th and Brannon Sts., San Francisco, Cal.

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 Co. 526 Monroe Ave., Grand Rapids, Mich.  
 Morey & Co., Inc. .... 410 Broome St., N. Y. C.  
 Toomey Machinery Co., Frank. ....  
 130 N. 3rd St., Philadelphia, Pa.

## PROPELLERS

Hamilton Aero Mfg. Co. .... *Milwaukee, Wis.*  
 Paragon Engineers, Inc. .... *Baltimore, Md.*  
 Standard Steel Propeller Co. ....  
 Pittsburgh, Pa.  
 Westinghouse Electric & Mfg. Co. ....  
 East Pittsburgh, Pa.

## PUBLISHERS

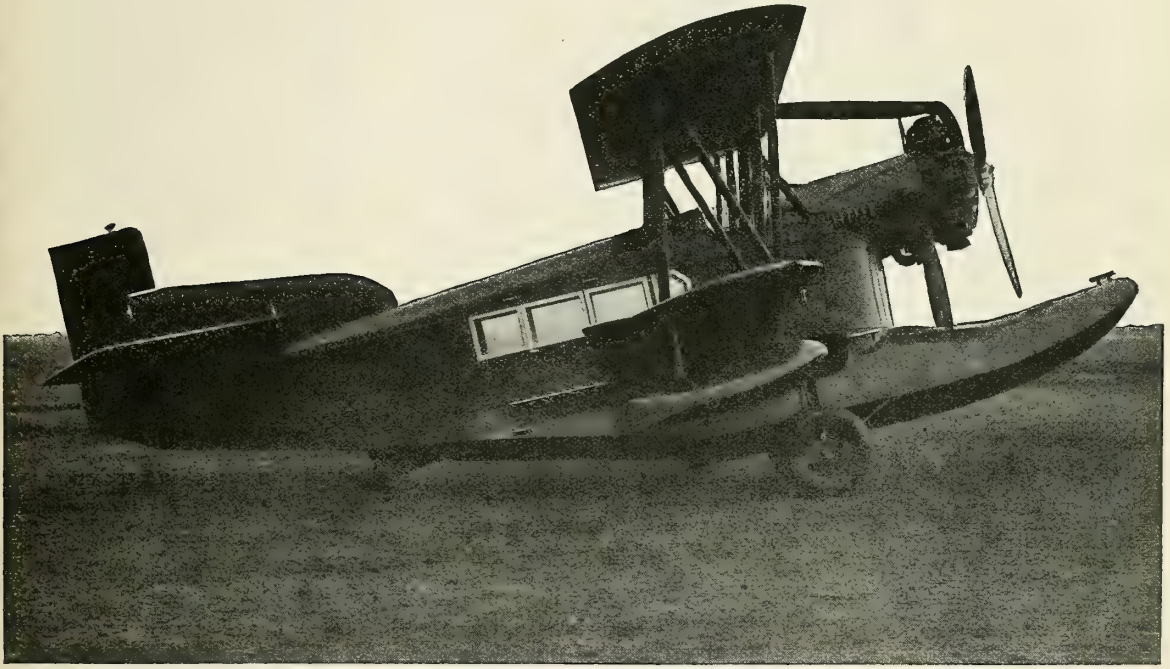
## (Aeronautical Books)

Alexander Aircraft Co. .... *Colo. Springs, Colo.*  
 Duncan, Capt. Richard. ....  
 729 Greenwich St., N. Y. C.  
 Field Ltd., Francis J. ....  
 Sutton Coldfield, England  
 Goodheart-Wilcox Co., Inc. ....  
 2009 Michigan Ave., Chicago, Ill.  
 Henley Pub. Co., Norman A. ....  
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 McBride & Co., Robert. ....  
 7 W. 16th St., N. Y. C.  
 McGraw-Hill Book Co., Inc. ....  
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 Ronald Press Co. .... 15 E. 26th St., N. Y. C.  
 Roth-Downs Airways, Inc. ....  
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 Van Nostrand Co., Inc., D. ....  
 8 Warren St., N. Y. C.  
 Weems System of Navigation. ....  
 858 Third St., San Diego, Cal.  
 Yancey, Capt. Lewis A. ....  
 425 West End Ave., N. Y. C.

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Radio Assn. of America. ....  
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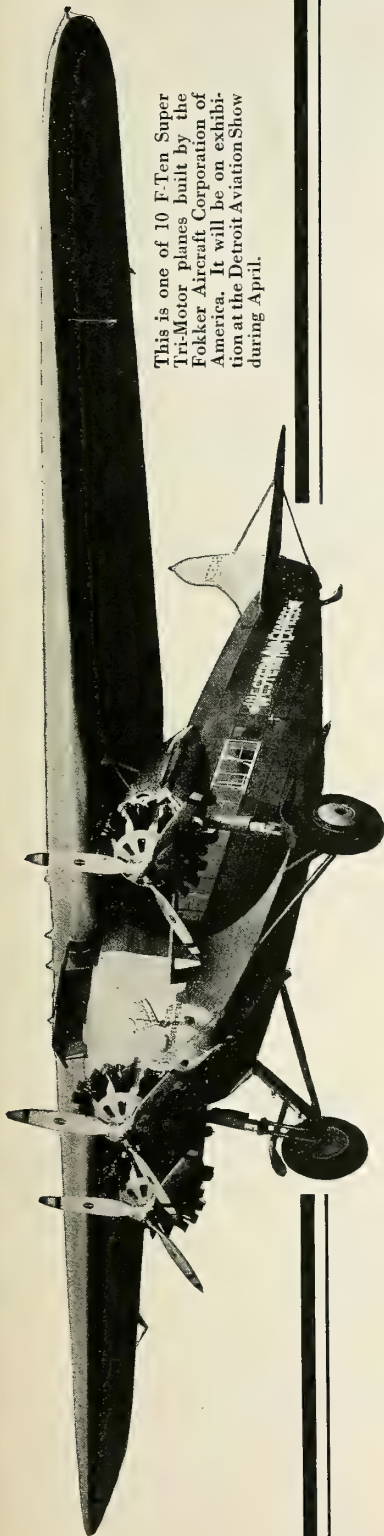
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## RUSTPROOFING

Udylite Process Co.....  
3220 Bellevue Ave., Detroit, Mich.

## SCHOOLS and DISTRIBUTORS

- Aero Corp. of Cal., Inc.....  
940 S. Western Ave., Los Angeles, Cal.
- Air Associates, Inc.....  
535 Fifth Ave., N. Y. C.
- Air City Airways, Inc.....  
Arcade Bldg., Racine, Wis.
- Airman Engineering Co.....  
552 Polk St., San Francisco, Cal.
- Airview Flying Service, Inc.....  
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- Allison Airplane Co.....  
Laurence, Kans.
- American Aircraft Corp.....  
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- American Eagle Aircraft Distributors, Inc.....  
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- American Eagle Airport.....  
Sharon, Pa.
- American School of Aviation.....  
3601 Michigan Ave., Chicago, Ill.
- Anderson's Flying Service, Harry.....  
Box 1471, R. No. 1, East Detroit, Mich.
- Associated Aircraft.....  
P. O. Box 5, East Boston, Mass.
- Associated Aviation Clubs of America.....  
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- Atkinson Aviation Co.....  
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- Atlantic Airport, Inc.....  
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225 W. 57th St., N. Y. C.
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- Bay State Flying Service.....  
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- Boston Aircraft Flying Service.....  
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- Brooklyn Aero Club.....  
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- Buhl Pacific Aircraft.....  
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- California Aerial Transport.....  
9800 West Pico Blvd., Los Angeles, Cal.
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- Chicago Aeronautical Service, Inc.....  
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- Challenger Flying Service, Inc.....  
Hagerstown, Md.
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- Commercial Aviation Co.....  
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This is one of 10 F-Ten Super Tri-Motor planes built by the Fokker Aircraft Corporation of America. It will be on exhibition at the Detroit Aviation Show during April.

## One of a fleet of 10 Western Air Express planes —finished throughout with Murphy Aircraft Finishes

THE flashing brilliance of the bright red fuselage and the aluminum wings, motor cowling and tail group will owe its permanency to Murphy Aircraft Finishes.

Contrary to the generally accepted idea of finishing, the *Ply-Wood* wings were finished with *Lacquer*. "Murphy Aircraft Clear Flexible Lacquer" and "Aluminum Bronze Powder" together do the trick. A

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MEMBER OF AERONAUTICAL CHAMBER OF COMMERCE

Say you saw it in AERO DIGEST





# ENGLAND'S

FAMOUS SPORT AND TRAINING PLANE

makes her American debut

with a New Name

*Its record of achievement  
is unapproachable*

NO other light training or sport plane has contributed more than the Avian to the conquest of the air and to public acceptance of the aeroplane as a safe, efficient mode of travel for business and sport.

The famous Avian stands on its record-making performances which immediately set it apart as the safest, most dependable and easiest to handle

training and sport plane in the world.

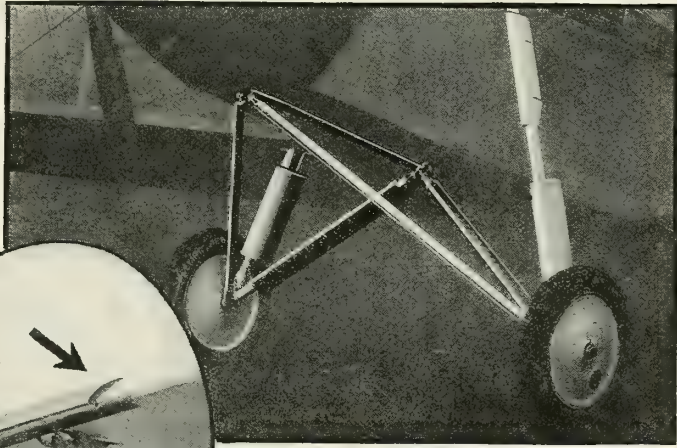
Its claim to fame is found in the records it holds:

First solo flight, England to Australia . . . Fastest time,

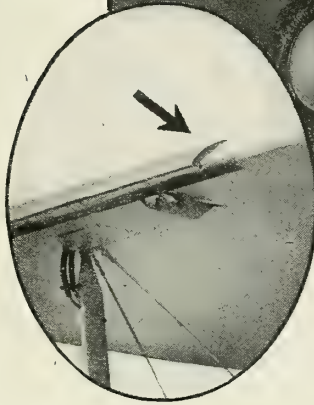
England to Australia . . . Longest flight ever made in a light aeroplane . . . Longest solo flight ever made . . . Fastest time, England to India . . . First non-stop flight, London to Rome.

Now this plane has arrived in America.

It is now under production in this country under sole royalty rights with the trademark, Whittelsey Avian.



**Slotted Wings:** (Handley-Page) standard equipment. Permits stalled turns without falling into a spin. Enables decreased landing speed. Improves lateral control. Practically eliminates possibility of ship going into spin in clouds or fog.



**Safety:** Wide tracked, sturdy undercarriage permits slower landing speed and lowers point of danger when landing on rough ground.

## Rich territories open to responsible distributors and dealers

When you sell the Whittelsey Avian you have something to talk about. No other light plane has such a background of achievement. No other light plane offers more attractive features.

**Easily Garaged:** When wings are folded one person can lift the tail and easily maneuver ship on ground.

**Power Plant:** Cirrus Mark III, 95 h.p. air-cooled, four-cylinder in-line aircraft engine. Famous for economy of operation and maintenance. Top overhaul at 200 flying hours.

**Price:** Only \$4995, Flyaway or F.O.B., Bridgeport, Conn.

**Economy of Operation:** 20 miles to gal. of gas; . . . 500 miles to gal. of oil . . .

**Speed:** Maximum, 102 m.p.h.; cruising, 85 m.p.h.; . . . landing, 35 m.p.h. . . .

**Ceiling:** 17,000 feet . . .

**Cruising Range:** 5 hours or 430 miles . . .

**Weight:** Light, 875 lbs.; . . .

**Acrobatics:** 1450 lbs.; Top 1600 lbs. . . .

**Dimensions:** Wings span, 28 ft.; Width folded, 9½ ft. . . .

**Height Overall:** 8½ ft.; length overall 24 ft.

We are completing national distribution of this famous light plane that

has already gained national acceptance.

If you believe that you are equipped to handle the Avian as an exclusive distributor or dealer for your airport we will gladly supply you with further information concerning our sales plan. Just write the Whittelsey Mfg. Co., Dept. A-4, Main Office and Plant, Bridgeport, Conn. (Formerly Whittelsey Body Co.

1 1 1

See the  
**WHITTELSEY AVIAN**  
at the All-American Aircraft Show,  
Detroit, April 6th to 15th



# The AVIAN *flies to* Fame



Bert Hinkler who blazed an amazing trail of record, hops from Croyden to Australia. His ship was an Avian.

**A**SHIP writes its own ticket in the air. And in the frail wisp of vapor slipping beyond the wash, the Avian has written a rather remarkable history. In adventurous air-miles this popular light plane has furnished unquestioned evidence of outstanding dependability, safety, performance in all kinds of weather and economy of operation.

As the saffron sun was pushing back the raw blanket of darkness on February Seventh, Nineteen Hundred and Twenty-Eight, the Avian began its climax flight that was to make record after record, that was to bring it deserved glory.

But prior to this eventful morning the Avian had won its spurs. It had gained the respect of the world's most famous flyers.

There was the light aeroplane competition at Basle, Switzerland, where

the Avian was awarded the maximum points for workmanship, construction and accessibility for repairs. It won the highest rating for the comfort of passenger and pilot.

At a competitive show near Paris, Avians placed first and second in quality tests and captured the same places in handling demonstrations. While in an 8-day reliability tour around France an Avian powered with a Cirrus was given the maximum rating.

Similar competitions in England furnished further proof to the air-wise that the Avian was first-choice among light planes.

But these successes were only the prelude to the greatest test ever made with a light plane.

On this February morning Bert Hinkler lifted his Avian from Croyden Field and headed into the sun.

That night when he set his plane down on Centocelli Field in Rome he had a record. In a single arc of the sun he had flown the 1100 miles that separate Croyden and Rome in a single hop.

Both plane and engine gave a perfect performance.

In the succeeding days the maps of Europe and Asia slipped under the sturdy carriage of the Avian. Through the blazing heat of North Africa, across the lazy Suez, above the rotting jungles of India and into the dirty weather that lingers like a threat above the Bay of Bengal, past Penang to Singapore the Avian blazed a virgin trail in the heavens. The engine "revved" through endless miles. The toughness, handiness and performance of the plane were a revelation.

Now just down on the other side of

the world was Hinkler's goal. It seemed that the impossible was about to be done.

Down Java's slender finger, across the straits to Lambok, then Kepang, a sea hop and then with the eyes of the world upon him Hinkler brought his faithful plane down at Port Darwin.

It was an epochal flight.

In 15 days Hinkler had flown his Avian from Croyden to Australia. And throughout this grueling flight neither plane nor engine failed to respond to throttle, stick or rudder-bar.

This flight alone marked the Avian as a hardy ship—fast, air-worthy and well-suited to touring in places where poor landing fields far outnumber smooth dromes.

A few months later another Avian came through a grueling flight successfully. This time it was piloted by a woman. Lady Heath, visiting in Cape Town, decided to make a solo flight to England. Civil authorities attempted to discourage her. They traced a line across the face of Africa from the Cape to Cairo. They pointed out the hazards of heat, desert, jungle, endless miles of veldt and lawless tribes.

Their fears were a challenge. Lady Heath, confident of her own skill and placing her faith in the ship she was flying, lifted her Avian from the field at the Cape and successfully negotiated the grueling flight to Cairo.

Then Lieutenant Murdoch of the South African air force made a successful speed flight from England to the bottom of the world. He reached the Cape in less than two weeks. On her astonishingly successful flight from the East Coast across the United States to the West Coast and return, Miss Amelia Earhart flew an Avian. In fact the plane she used was the one that Lady Heath flew from Cape Town to Cairo.

### *There's More than Luck to Such a Record of Performances*

In the Avian's long record of performances the experienced pilot recognizes the merit that has made this aeroplane the leading sport and training plane of the world.

It is endowed with the riches of long experience in the design, testing and flying of light planes which began when the first Avian was produced in 1922.

The Avian is the result of the finest engineering and flying brains culled from the world and harnessed to the task of building the safest, easiest to handle, most economical and sturdy plane it is possible to construct.

**Safety:** With 8 the factor of safety the Avian is one of the most popular planes for sport and training. Air worthiness permits acrobatics at a total loaded weight of 1450 pounds, normal flying at a weight of 1600 pounds. The Avian, pilot, passenger and 50 lbs. of baggage weigh 1410 pounds.

The split-axle undercarriage with its unusually wide tract, exceptional strength and greater resilience insures safer landings. The Avian can

ing of the Avian at slower speeds. **Economy of operation:** Fuel consumption 20 miles per gallon and oil consumption 500 miles to the gallon. **Ease of Maintenance:** Most working parts being fitted with lubricators, indicate the ease with which the Avian can be maintained. The engine is at comfortable height from the ground for purposes of adjustment.

Engine cowling can be detached in a few moments.

The whole of the fuselage is separated from the power unit by a fire-proof bulkhead.

**Ease of Handling:** One person can fold or spread the wings unassisted. When wings are folded one person can easily lift the tail and manoeuvre the machine without effort. The wide track of the undercarriage and the steerable tail skid make taxiing easy.

**Easily Garaged:** When the wings are folded the Avian occupies a space only 9½ feet in width (⅓ its width when wings are spread). It can be garaged in any ordinary shed.

**Comfort:** The cockpit of both pilot and passenger are roomier and more comfortable than usual. Occupants are protected by adequate wind-screens. The luggage compartment behind the pilot's seat is large enough to accommodate two full-size suitcases, tools, spare tire, etc.

For training purposes the Avian has a dual control. For sport flying the control column in the front cockpit can be removed and the rudder-bar disconnected.

For sport and training there is no light plane better suited for day-in and day-out flying.

This famous plane has blazed a virgin trail over many parts of the world and has proved its toughness, stability and flying qualities under all weather and temperature conditions. The Avian is the light plane for the pilot who flies for sport and for the flying instructor.



Lady Heath, the daring British pilot who successfully flew her Avian from Cape Town to London.

be turned in its own length.

Slotted Wings (Handley-Page) make a spin practically impossible. And statistics show that the accidents due to spins exceed in number those due to all other mechanical difficulties and human mistakes. This safety feature also allows the land-

. . . now this ship  
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# INTERIORS of CABIN AIRPLANES

(Continued from the March Issue of Aero Digest)

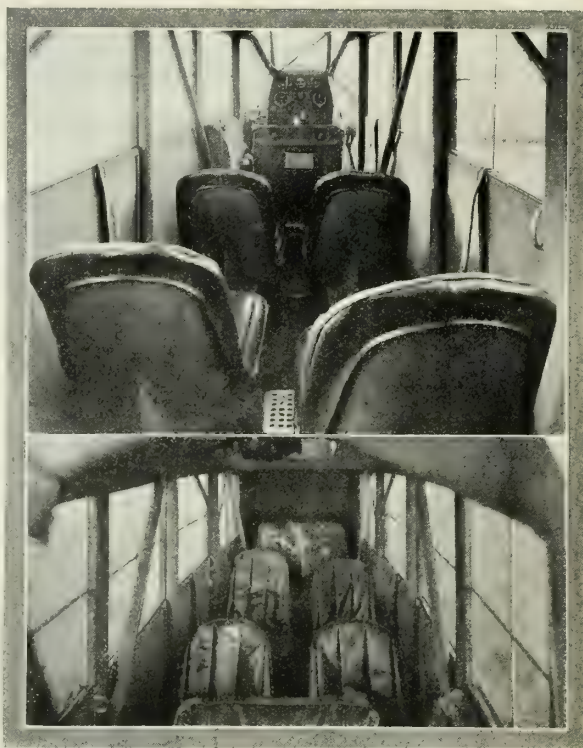
THE matter of comfort in flying is of such importance that not only are the various aircraft producers applying every means to improve it, but also the Government is studying it thoroughly and from every angle. The research work of the National Bureau of Standards has contributed greatly in the development of cabin planes. The vibration and the noise of engines have been effectively reduced as a result of the Bureau's special investigations on the insulation and construction of cabin walls. Methods of deadening sound have, of course, long been used in the construction of buildings, usually by allowing a dead air space in the walls. However, because of the light structure of airplanes and the peculiar overtones of aircraft engines (particularly on multi-engined jobs,) these old methods were not applicable, and new means of absorbing sound had to be developed. Airplane manufacturers have already applied the principle of insulation as derived from this study, and, it stands to reason, they will be equally ready to adopt the results of the Bureau's more recent work on the construction of cabin walls.

This is only one phase of the constantly improving comfort of modern cabin planes. Many other features are included in the following descriptions of specific cabin types.

## Fairchild Cabin Planes

The Fairchild Airplane Manufacturing Corporation is now producing two new cabin models, the 41 and the 71. The cabin of the Model 41 is designed to accommodate three passengers and a pilot. The interior upholstery is in two-tone leather and broadcloth. A thick layer of kapok sound-proofing is built in back of the upholstery. The trim is finished in grained walnut. The rear seat, which is continuous across the back of the cabin, is upholstered in leather and has deep Marshall spring cushions. Under this seat is a locker for tools, and back of it is space for several suitcases. The individual front seats, which are of metal, also are fitted with spring cushions. The pilot's seat is adjustable fore and aft. The front passenger seat may be reversed to face aft. Safety belts to match the upholstery are provided for all seats.

Doors are fitted with triple locks. The windshield and forward windows are of non-shatterable glass. The window beside the pilot is adjustable up and down. The floor is covered with an automobile type carpet. The cabin may



Fairchild cabin type in production until recently.

be heated and is well ventilated to provide consistent comfort.

In general the cabin of the Model 71, a seven-place ship, is similar in appointment to the 41. Like the smaller Fairchild, it is upholstered in leather, with walnut trim; is fitted with sound-proofing, has spring cushion seats, etc. A separate baggage compartment is provided, which is entered from a door on the outside.

## Hamilton Metalplane

Because of its unusual comforts and speed, the Hamilton all-metal cabin monoplane has gained an enviable reputation as a transport plane. To reduce the sound of the engine so that passengers may converse comfortably, the inside of the cabin around the frame work is well padded with Dry-



Interior of the new Fairchild 71. These views provide an interesting comparison with those of the older type above.

# A CATALOGUE...

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thimbles			bushing	extinguishers

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Looking forward in the Hamilton Metalplane.

Zero. The chairs are of wicker with cushion seats and are so placed as to afford sufficient leg and shoulder room. An aisle between the seats makes it easy to walk fore or aft in the cabin. Large glass windows alongside the seats allow an excellent view of the country below. A wide variety of upholstering materials has been used in the several Hamilton planes. These materials range from artificial leather to velour and Bedford cloth. The cabin is provided with heaters and with dome lights. A door at the forward end leads to the pilots' cockpit. There is a glass window in this door so that passengers may watch the pilot at the controls.

Conveniently located aft of the passenger cabin is a complete lavatory, with wash bowl, toilet, mirror, soap container, towels, etc.



Appointments in the new 4-place Travel Air.

#### Travel Air 4-place Monoplane

The Travel Air Manufacturing Company has recently supplemented its six-passenger cabin plane with a smaller four-place cabin ship. The latter is essentially like its predecessor, embodying as it does all the well-known refinements of the 6,000. The seats, which are placed side by side with adequate space between, are securely fastened by a special arrangement. On the back of the seats are large pockets for magazines, papers and personal belongings. Dual controls of the Dep type (unusual in a ship of this size) are conveniently located for the two front seats. The upholstery is a handsome and durable broadcloth.

Excellent visibility forward and to the sides is afforded by large windows, which may easily be raised or lowered by bell cranks of the automobile type. The cabin is not only well ventilated but also is provided with a heater for winter flying. Overhead there is a dome light for night flying.

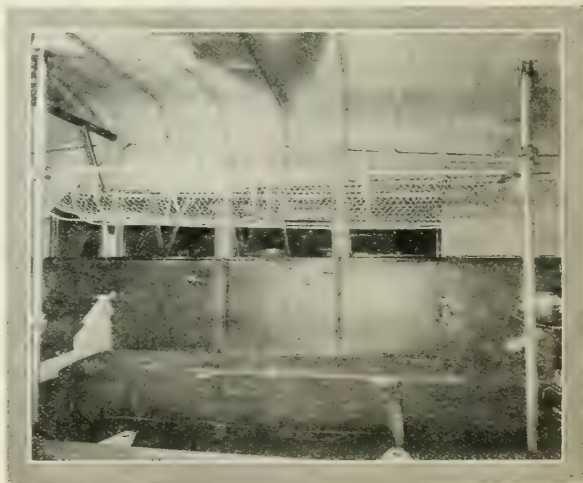
#### Loening Amphibian Ambulance

The new Loening amphibian ambulance presents an interesting innovation in cabin interiors. Although this particular plane is produced for military purposes, it undoubtedly will find a useful place in commercial aviation. This ship may be converted into a transport. As a transport, it carries six passengers besides the crew of two; and as an ambulance, it carries two patients in stretchers, two medical attendants and the piloting crew.

The cabin, which is unusually roomy, is well lighted by large adjustable triplex glass windows on each side. Because of the large double door located on the port side, stretcher patients may easily be carried into or taken from the cabin. Two stretchers are firmly supported one above the other on the right side of the cabin, and ample space is arranged alongside of the stretchers so that the attendants may be unhampered in caring for the patients. Seats for the attendants are at the forward end of the cabin. Four thermos flasks and other medical equipment are conveniently stowed at the rear. A heater is installed to assure comfort in cold weather.

An interior such as this is especially interesting since it embodies several departures from conventional practice. Moreover, there is an especial need for this type of ship, since airplanes can easily reach more inaccessible localities and transport patients with great speed than any other form of conveyance.

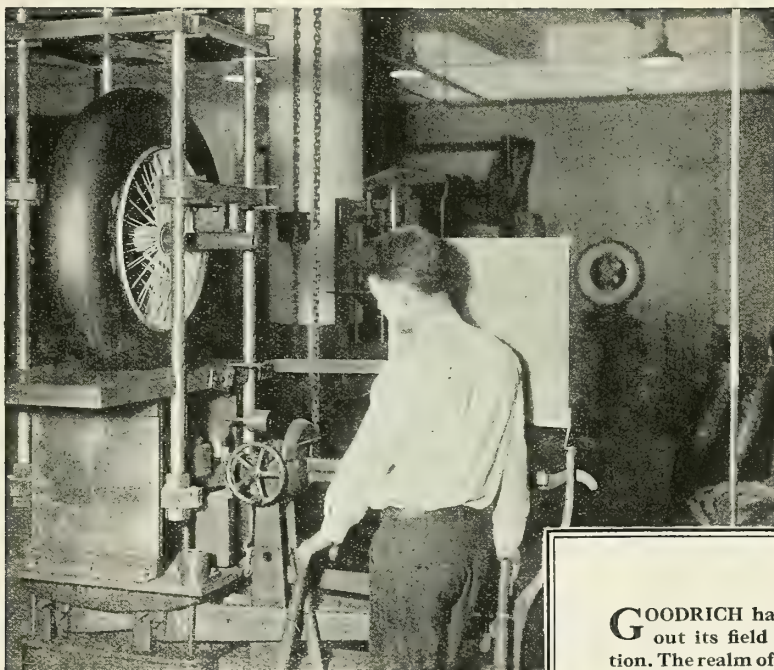
*(To be continued in the May issue)*



Position of the stretchers in the Loening.

# Tomorrow's Improvements *may be seen in* Goodrich Laboratories *Today*

The aeronautical laboratory  
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And in Goodrich laboratories *today* you will see similar other materials being developed into tested aviation products of tomorrow.

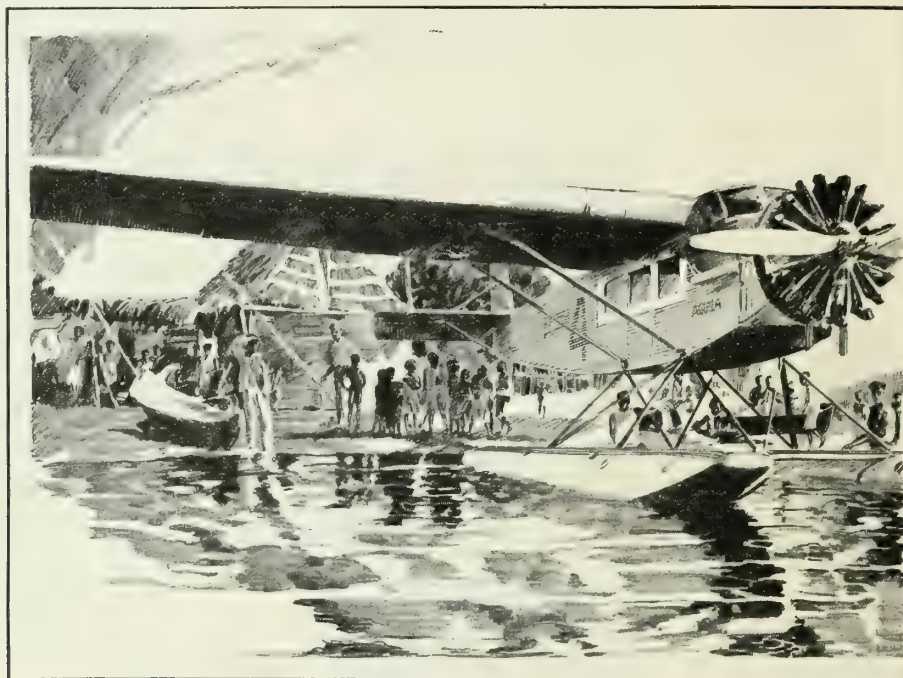
**G**OODRICH has staked out its field in aviation. The realm of heavier-than-air-craft is its zone of endeavor. There Goodrich has pioneered . . . there Goodrich has helped to write history. And there Goodrich leads with products as far advanced as the modern flying field is advanced over the fairground landing lots of twenty years ago.

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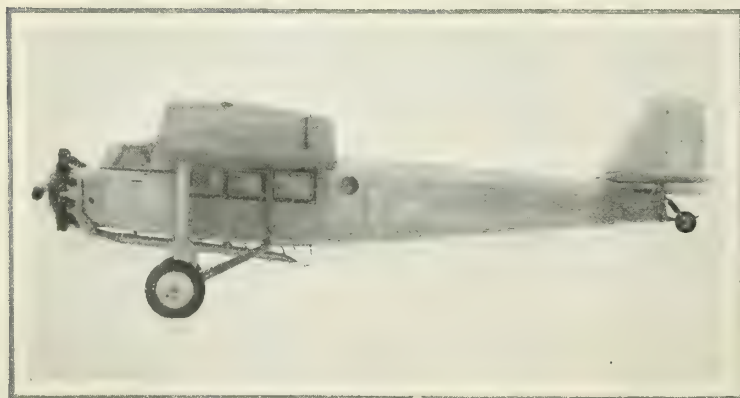
## Goodrich Rubber for Airplanes



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The sketch at the top of the page was drawn from an original photograph taken by the Cortagena office of the Andian National Corporation Limited of Toronto, Canada. The plane is used by this company for maintaining contact with the interior.



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# PERSONALITIES



WELL, boys, the time seems to have arrived for you and me, as supposedly dominant males, to shed a few pathetic tears together about our rapidly diminishing dominance. For there isn't a doubt in my mind that said dominance is proceeding with appalling speed in the general direction taken by the dodo, the pterodactyl, and the dinosaur when they wended their way toward total extinction. Soon, I fear me, our admitted superiority over the weaker sex will be but a fond sweet memory, mentioned regretfully and tearfully in the more saccharine novels, and alluded to only by writers far gone in senile decay or Hooverized likker—for I hear that the new head man of this nation is going to try his best to clamp on the lid. But let's not get on that. What I am getting at is the way these girls and women have been forging ahead and taking their places right beside men in aviation—and in some few instances stepping up one rank on the boys.

Now, that isn't right. As a man—and a big fat man, at that—I rise in my puny wrath and protest that it isn't fair; it shouldn't be allowed. These women should be held back; they should be restrained. Here we've been coddling them for centuries, telling them they were the weaker vessels—fragile creatures to be protected—and made to wash the dishes, incidentally. And now they leap forth in all their Pankhurstian fury and learn to fly! It's simply monstrous! As a man who has been flying for 15 years I protest against it. I resent it! Why should these women compete against me—and show me up? Why should Elinor Smith, a little bit of a seventeen-year-old girl, that I could gladly administer a severe spanking to,—why should this mere infant establish a world's endurance record for women by staying in the air for 13 hours, 16 minutes, and 45 seconds, when the longest time I—or most other male pilots, for that matter—have ever been in the air is a mere 8 hours? Why should this child go and do this thing to me—and to the rest of you supposedly superior males? Why should she do it, the little rascal? That's what I want to know. Elinor, you speak up, now, and tell Uncle Cy why you went and did this thing to him—and to the other bold men pilots, whom you know—or whom you ought to know, child—are your superiors in manly sport. My dear, don't you know that you were supposed to stay at home and wrestle with the dishes for papa? And don't you know you weren't supposed to wear us men's britches? Don't you know that? And whose were they? That's another thing I want to know. Were they papa's? And if so, what was he doing that he wasn't guarding them when you were around? He should have known that his britches were in danger—and a flock of records, as well. Oh, it's all very hopeless to me, Elinor. I'm very discouraged about

the whole affair. Who wouldn't be?

But, after all, little Elinor is by way of being a friend of mine, so I have to forgive her for showing up us more capable and daring men, though I hate to do it. What she ought to get is spanked. I insist on that, as a man. (I must uphold my pre-dominance somehow, and that's the only way I can think of.) But Elinor wrote me



Miss Elinor Smith

a letter, in reply to one of mine, so I'll just print what she wrote. And I'm for the child. I am, though I resent her—I think she should be suppressed. And I promise you boys that when I meet her again I shall do my best to suppress her, although I haven't much hopes on that score. Still, I shall speak very sternly to her, and advise her to get back to the dishes, so derive what comfort you can from that.

But I'll have to give you the low-down on this correspondence between Elinor and me. Or I should say, "Me and Elinor," for I refuse to grant first place to any mere girl. A month ago I sent out a bunch of circular letters to all licensed pilots. And you know how circular letters are addressed—"Dear Sir." Well, this young rascal writes back: "Mr. Cy Caldwell, Aero Digest: Dear Madam: Oh, I beg your pardon for that slip of the typewriter, but after being addressed as 'Sir' in your letter to me we are even now." (Do you note how fresh this kid is, even at 17? It's terrible!) "In answer to your request for a biography, I

was born in New York City on August 17, 1911. I received my first flight in an airplane at the age of 8 and have been at it ever since. I soloed at the age of 15 and flew until I was old enough to get a private license. Right now I am waiting rather impatiently for my 18th birthday to roll around so that I can graduate to a transport license. They tell me that I hold the American women's solo record for altitude, and that I am the youngest licensed girl flier in the world. Also that I am the first person that has successfully flown under the four East River bridges in New York with a land job. As to this last, don't gain the impression that this is my idea of furthering aviation. It was merely done as the result of an argument in which I was told that such a thing was an absolute impossibility. So I insisted that it wasn't. You see, to score my point, I really had to do it!"

Of course you had, my dear child. I quite understand that—I've been married for over 8 years, and am still working at the business. And I rise to remark that if you were arguing with a man you were arguing with an idiot. For no sensible man ever argues with a woman. The thing can't be done successfully. Even when she's wrong, she's right—or any really sensible man will gladly admit that she is right, to save himself breath and annoyance. (I do it daily.) But whatever led you to believe that those four bridges couldn't be flown under? If the huge battleship *Colorado* can go under them in order to get into the Brooklyn Navy Yard, can't you get under them in a Waco in order to get into the papers? Now, can't you, Elinor? But why argue with you? I must try to remain sensible. Of course you were right, my dear—you had to fly under those bridges. I can see that at a glance.

IF little Elinor was the only one of the weaker—shall we say the feebler?—sex to embrace aviation, I could rest content. But this revolt of the embattled female has penetrated even into the sacred—or I thought they were sacred—confines of my own small, though sometimes militant, family. The wife of my bosom (I understand that's the biblical way of referring to women you get mixed up permanently with) has declared her intention of learning to fly herself, and has handed me a ukase, or message, to the effect that she is taking lessons this spring. Although I pride myself on being sensible, I *did* argue feebly in this case—a thing I should have known better than to attempt. I spoke in a whisper for several seconds before I was stopped or stunned into the standard matrimonial silence. After which display of harsh masculine dominance I subsided and agreed to her learning to fly. Poor thing, she has flown with me for over 175 hours, so I can hardly blame her for wanting to improve

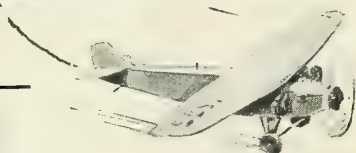
(Continued on next page)



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*(PersonAIRlities continued)*

on the brand of piloting she has endured so patiently. Of course, she has done her part from the back seat, but there is no control there—and merely hitting the pilot over the head at intervals hardly compensates for the lack of a joy stick and rudder. So my little helper, guide, and friend will essay the business on her own this spring—and I hate to think with what contempt she will view me when once she goes solo. To date, I have been able to retain a semblance of superiority—I knew it was only a semblance—but in the spring even that will be gone. I only pray that Myrle doesn't insist that I stay at home to wash the dishes.

**PILOT ROY M. DAY** was formerly superintendent of the Tampa Municipal Airport, Tampa, Florida, and flying instructor for the McMullen Aircraft Co. of



Roy M. Day

Tampa. He is now flying for the Floyd J. Logan Aviation Co. of Cleveland, distributors of the American Eagle in Ohio and Kentucky. We got together a while ago in a hotel room in Cincinnati, along with a passenger I was flying down to Atlanta and a large stone jug containing a brand of likker known as "Ye Whisky of Ye Monks." That stuff was as smooth as velvet and as powerful as the hind leg of a fully-grown elephant. Two drinks of that liquor, and you up and told the world the truth as you saw it. Well, we got to talking over flying accidents and how to avoid them, with illustrative incidents of birds who hadn't avoided them. And all this time the passenger was sitting there, drinking "Ye Whisky of Ye Monks" and becoming more and more thoughtful with every sip. By one a. m. there wasn't anything unfortunate that had happened to an airplane that this passenger of mine hadn't learned about; with the result that he went to bed and dreamed of jammed controls, crossed controls, engines falling out, wings falling off, and general destruction at high altitudes. I still admire him for having the fortitude needful to fly on to Atlanta next day with me, though he admitted that after that session, if the weather had been too bad to fly in, he would have taken a train without a single regret. Moral: When drinking "Ye Whisky of Ye Monks" park the passenger in the next room, and close the door on him.

**GOT** a letter from A. L. Wimshurst, former R.F.C. pilot, who writes: "I have often wondered if you were one of those Bozoes who used to fly over our airdrome at Vert Galland, spelling not guaranteed. But it was near Doullens and about 100 yards from an ammunition dump. Almost nightly the F E's would drone over our heads at a

most ungodly hour and return a little later—very often accompanied by a couple of Huns of the egg-laying species. Whether you fellows were showing them the way to Doullens, via our airdrome and ammunition dump, or whether it was just a co-incidence, we never found out. But we became very proficient in the art of sliding out of bed and into the funk holes which we had dug under the floor of our Nissen hut. We painted our hangars until they looked like nothing in particular, and carefully camouflaged the bare spots on the airdrome. Then we rested easy under the comfortable assurance that no night bomber could see us—until an F E pilot dropped in one day. Over his fifth whisky and soda, the Major asked him if he could see our airdrome at night. 'Why sure, old top,' he said, evidently wishing to be congenial. 'In fact, we use it as a landmark!' We dug our funk holes a little deeper."

One of the popular delusions current among day pilots was that their airdromes could be camouflaged so that a night bomber could not see them. The poor fellows would spend gallons of paint camouflaging a flock of hangars—and all they achieved was that the hangars thereafter stood out more distinctly under the pale light of the moon. Besides, how can you camouflage a large bare field. Very simple fellows, those day pilots. But then, one had to be simple to fly an R E 8 or a Camel. The really thoughtful pilot got himself an old F E and sneaked around at night, remaining invisible most of the time. Undistinguished—and uninjured—was the rule for night bombers. When the war ended, most of the old night pilots were right there on the dock, waiting for the tickets to be handed out.

**THE** serious gentleman in the pants is my friend Morton Bach, designer and builder of that very efficient airplane, the Bach Ten-Place Transport. Morton is probably



Morton Bach

the only living airplane designer who could wear those pants and not burst out laughing. He is now 28 years of age, and by the time he's 30, he'll tell the tailor to put less material in them. He could pretty nearly cover an aileron with the surplus material in that pair. Boys will be boys! Bach has been building airplanes since 1912, when he constructed a glider and flew it from the Pacific Palisades, off Santa Monica. Of course, when I say that he flew it off those Palisades, I am merely reporting what Wilbur White

told me. What I suspect happened was that he got in the thing and told someone to give him a push. And then he and the glider went on down until the Pacific stopped them. And I imagine those pants held him up until rescue arrived. Morton, if that isn't what happened I invite you to write your own account of the affair, and I'll publish it. I asked you to write it, anyhow. And you wouldn't—and now see what's happened to you!

**ROBERT L. ROCKWELL**, of the famous Lafayette Escadrille, is in charge of the Embry-Riddle Flying School at Lunken Airport, Cincinnati, where he will instruct



R. L. Rockwell

all students in acrobatics and standardize the instruction methods of the other pilot instructors. Rockwell flew with Bert Hall, Raoul Lufberry, Delage Demeaux, and William Thaw and holds an enviable war record. When the war broke out he was in a French hospital completing his medical studies and serving as assistant to the chief surgeon. But the war ruined one perfectly good young doctor, for he joined the French aviation service in 1916—probably deciding that he could cause more casualties with bullets than he could with a scalpel. The main difference between a pursuit pilot and a surgeon is that the surgeon receives more money per victim. Besides, the patient isn't allowed to carry arms.

Rockwell had a strange adventure while flying back from a patrol. Suddenly his plane went out of control and turned over on its back. At the same time he heard the explosion of a large shell. Probably the rush of air caused by the shell's passing had whirled him upside down, for it was quite a common occurrence to feel severe bumps at high altitudes while crossing the lines. The only explanation of these bumps was that they were caused by the passage of large shells—not anti-aircraft, but the big boys roaring over. Rockwell righted his plane and flew at once to the nearest *estaminet*.

On another occasion he had singled out one of seven Germans and was diving on him with the sun directly at his back, when he saw the fabric ripping in spots from his own plane and looked back to see another enemy right on his tail and calmly pouring bullets at him. Doctor Rockwell performed one of the fastest operations of all time and managed to escape and get home. When he landed he found that he had been sitting directly between the stream of bullets from two Spandau guns. They had cut the fabric of the wings to ribbons on both sides of the cockpit and had almost severed his controls. He'd had as narrow an escape from death as one of his own patients.

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Light in weight, even the largest sizes of drains were easily handled.

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A rock backfill was dumped in without ceremony; no special care was required in moving equipment over the newly made fill. Armco perforated pipe is flexible — it cannot break.

You can have the dependability of Armco drainage for your Airport, too. Because of the simplicity of Armco perforated iron pipe installation, a full drainage system can be quickly completed. Let us give you full information.

ARMCO CULVERT MANUFACTURERS ASSOCIATION  
Middletown, Ohio



Armco culverts and drains are manufactured from the Armco Ingot Iron of the American Rolling Mill Company and always bear its brand.

# ARMCO *perforated* PIPE

© 1929, A. C. M. A.



# AIRPORT AND AIRWAY

*News of airlines, airports, and airways; radio, lighting and other auxiliary services*

## A Unified Aircraft Radio Service

THE conclusion reached at the recent meeting of radio representatives of the leading air transport companies, held under the auspices of the Aeronautical Chamber of Commerce, was that a cooperative system of radio communication should be evolved for establishing and maintaining a chain of radio stations along the principal airways. These stations are to be spotted at distances of 50 to 150 miles apart, making the most advantageous use of the 64 available high frequency radio communication channels.

In spite of the wise move of the principal operators to combine their radio communication work on a cooperative basis, there is every indication that we are heading toward radio chaos in the channels assigned to aircraft communications, similar to that experienced in the broadcasting field. Here also we had a major cooperative effort, sponsored by leaders in the field, somewhat confused by numerous independents, all seeking to give the public broadcasting service.

The aircraft situation is further complicated by the fact that two or three different channels may be required in the high frequency band to render the same service at different hours of the day and night. Many different kinds of communications are necessary: code and radio telephone weather information broadcasts, navigation aids by radio compass and direction beacon services, position reports as planes pass over airports, airport landing instructions, and private message communication. The prospective growth of air radio traffic, as transport planes become equipped, is literally enormous. Without nationwide coordination of every single airport, aircraft and airway radio transmitter, the all-too-few available frequencies will be inefficiently utilized and interference will add to the hazards of flight. Experience will soon prove that an immense wire system of inter-communication among airports is necessary to take the load from the ether, saving for radio communications only that service which must be rendered by radio and can be rendered in no other way.

Today, there is little or no confusion

By  
Edgar H. Felix

because aircraft radio has not come to its own. It requires only a few hundred aircraft radio installations and 40 or 50 airport transmitters, however, to bring us face to face with this problem. The Aeronautical Chamber of Commerce has contributed a constructive step by bringing about the cooperation of the leading air transport services. But the independent operator will always be a large factor, and the number of air transport lines will grow rapidly. Hence, more than a combination of the leaders of today will be required to bring about a permanently satisfactory organization of aircraft radio communication. Unquestionably, the most desirable service would be rendered by turning over the 64 channels to a national aircraft communication monopoly, mutually supported by every pilot who uses an airway.

Through the organization of a single company, the complication arising out of the establishment of numerous airports at congested centers will be logically disposed of. A single, high power transmitter will be maintained at the most suitable point, while the individual airport will use low power communication for its immediate needs. This same principle has been successfully applied in marine communications, the individual shipping companies being offered a service of shore stations, rather than being concerned in any manner with decisions as to where or how such stations should be erected.

The principle of issuing radio transmitter licenses, first come first served, inevitably leads to hardships later on. Unimportant points have much more than their just share of frequency assignments. The discrepancies thus arising cannot be easily equalized unless all aircraft communication is operated through a unified organization which redistributes facilities according to developing needs. At no time can a more favorable adjustment of the problem be secured than at the present and any delay is certain to be costly. Let us profit by past experience in radio communications.

## Organizing the Airways

IN his address at the annual meeting of the New York Railroad Club, C. M. Keys, chief executive of the Transcontinental Air Transport, Inc., outlined the fundamentals of air-rail transportation, in which the principal railway systems of the country have interested themselves. After outlining the prospective increases in rail travel to be expected as the result of air travel, Mr. Keys discussed some of the problems encountered in setting up a thoroughly organized air transport system. Colonel Lindbergh and a group of engineers and pilots set out to locate suitable fields at Columbus, Indianapolis, St. Louis, Kansas City, and to determine the best junction point after the overnight run on the Santa Fe. The route determined upon connected Las Vegas and Los Angeles, with intermediate stops at Gallup, Winslow and Kingman.

"We did not find a single field from end to end of that line," said Mr. Keys, "that met the requirements laid down by Colonel Lindbergh. The intervening period since last May has been entirely occupied by a group of men working under high pressure getting these great fields located, laid out, or improved, and preparing for the installation of hangars, runways, gas stations, and other appurtenances of a flying field. This work will not be completed, in fact, until the early spring of 1929.

"On top of this is the purchase of equipment. This again involved a number of tests in Los Angeles, Seattle, Detroit and New York of the available ships for this service. These tests could not be completed until September because some of the planes were not flying until that month. The initial purchases of equipment, after these tests had been completed by Colonel Lindbergh, were about \$1,000,000 and this will be considerably increased before full operations can begin.

"We laid down as a fundamental in the first instance that there must be two factors in this operation which are not found in complete form in any other air transport operations in the country, namely: first, an intensive meteorological service along the right of way, and, second, a complete

*(Continued on next page)*



Hangar at Alexander Airport, Wausau, Wisc., base of Northern Airways, Hall Aircraft Corp. and Associated Aviators.

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# AIRPORTS

## of All-Weather Permanency

*—built by* LEONARD MACOMBER, Inc.

AIR minded cities must build for the century, not for the moment. The airport that swings the nation's air traffic to your community will be more than a landing field—it must be built by experts who anticipate tomorrow's demands.

Leonard Macomber, Inc., one of America's leading public park and golf course architects and constructors, with a background of 18 years' experience, has established a complete airport development service, composed of men who are veterans in things aeronautical. Leonard Macomber, Inc., is a highly specialized organization of men who have recognized today what the world of aviation will demand tomorrow.

This organization is equipped to give comprehensive airport

service, including: preliminary flight and topographical survey; selection of site; plans and specifications for field layout, marking, draining, grading, leveling, surfacing, runways, lighting, mooring masts, buildings and hangars; complete engineering, architecture, construction and consultation. This organization will furnish skilled supervision and will contract for all or any part of your airport needs.

The complete "one-profit" contracting service offered by this concern assures economical outlay and expenditure and results in a completed airport of minimum maintenance cost.

City officials, Association of Commerce and owners of private property who wish to develop airports are urged to communicate with us immediately.

*Design and construction by Leonard Macomber, Inc., is the best assurance that the completed airport will receive the highest possible government rating.*

LEONARD MACOMBER, INC.

*Airport Builders*

664 North Michigan Ave., Chicago, Illinois

### *At Detroit—*

*Principals of this company will be at the Book-Cadillac Hotel during the Detroit Aircraft Show.*





Night view of Albany Airport floodlights.

(Continued from preceding page)

communications system along the ground, and a complete communications system between the plane and the ground, and between the ground and the plane.

"In the establishing of this detailed weather service, we have been enormously assisted by the two railroads—the Pennsylvania and the Santa Fe, and I am glad to state here, especially before this audience, that the coöperation of the railways in this respect has been whole-hearted and splendid. The Weather Bureau has also gone as far as it can go, and probably as far as it could properly be allowed to go under the law, in helping us to establish for the benefit of this service, a complete meteorological system."

With respect to the communications system, Mr. Keys stated:

"The radio communication consists of two elements: first, the radio direction installation and, second, radio communication both ways. The directional radio has been worked out in close coöperation between the Government and the radio companies, and this installation, which will give to the pilot his general location at all times while in the air, both by day and by night, is more or less standardized, being in use on many of the air mail lines of the country.

"The actual audible communication between the plane and the ground and the ground and the plane is number one factor of safety in passenger transport. It is the block signal system of the air. An air transport passenger line without it will be illegal a few years from now.

"Intensive research has been carried on by the radio companies for the past six months, and as a result, we are now promised definite installation in the plane at a weight that is more or less negligible, so that our pilots can communicate instantaneously and at all times with the ground stations to ask additional weather information, wind velocities, et cetera."

In the field of air transportation, as in any other new industry, thoroughly organized and well financed companies will take the leadership in development. Even in the present pioneer status, the establishment of an airway and air line is a project requiring tremendous capital, equipment and organization.

#### Boeing Reports Traffic Growth

**F**LYING 258,439 miles over 3,565 miles of airway at an average speed of 99.7 miles per hour, 44 Boeing System planes carried 139,846 pounds of air mail on the San Francisco-Oakland-Chicago and Seattle-Los Angeles routes during January. W. G. Herron, vice president in charge of traffic, who issued the statement, said that, in addition to the mail, 130 passengers were flown 55,240 miles. Several hundred pounds of air express was transported on both the routes.

Total time of all planes in the air was 2,650 hours, on 167 scheduled trips. Only 8 per cent of all delays were caused by mechanical failures, while 40 per cent of delays were due to adverse weather. There were seven forced landings, in which no one was injured. Two planes were damaged so that extensive replacements were necessary. Up to February 1, Boeing System had flown 4,385,106 miles, transporting 1,647,451 pounds of mail and 5,566 passengers.

One of the important factors in maintaining this high reliability of service is the careful and systematic plane and engine inspection made of each plane daily, involving 75 classified routine inspection points. The form sheet, fastened to the plane as soon as it enters the hangar, lists all these items under heads of engine, section, fuselage, wings, landing gear, lighting system, tail assemblage, control, services, repairs, adjustments and final tests.

#### New Air Routes

**A** NEW air-rail service that cuts 17½ hours off the all-rail schedule between New Orleans and Los Angeles was inaugurated recently in coöperation with the Texas & Pacific Railroad Company. The planes operate between El Paso and Los Angeles, westbound passengers arriving by train at El Paso at 8 a. m. and leaving aboard planes an hour later, arriving at Los Angeles at 5:30 p. m. Pacific time. The air-rail time between the two cities is 36 hours. Single motor Fokker planes are used, carrying six to eight persons.

**A**N air passenger route is to be established by Southwestern Air Fast Express. Tri-motored Ford all-metal planes will be used. Stops are to be made at Kansas City, St. Louis, Tulsa, Oklahoma City, Dallas, Fort Worth and Waco.

**T**HE American Air Transport Association has issued a consolidated air passenger time table, showing the operation on 42 daily schedules, calling for 33,458 miles of flying every 24 hours, with stops at 102 cities.

**T**HE United Parcel Service is organizing a low rate air express service along the Pacific Coast, shipping parcels by air transport, connecting with their local delivery service in Los Angeles, San Diego, San Francisco, Seattle and Portland. The United Air Express rates are considerably lower than air mail charges and, in most of the principal cities, include delivery by their regular motor parcel service.

**T**HE Hudson River Navigation Corporation, operating a night line between New York and Albany, will inaugurate a schedule of two daily seaplane trips this summer, making the journey in 80 minutes. Coastal Airways, Inc., will run the line.

#### Airport and Airway Developments

**A** CHART in *Domestic Air News* indicates the development of air navigation aids on the 19,888 miles of 48 airways now being flown by American operators in or from the United States with mail, passengers, freight or combinations. In this

(Continued on next page)



Bank of 1500 and 3000-watt, 32-volt floodlights at Albany Airport.



New hangar for the National Air Transport Company at Cleveland Airport designed and built by Austin.

## Do You Want this Experience and Complete Responsibility Behind Your Project?

A COMPLETE Survey and Report for a great municipal airport on the West Coast, site selection and layout for a port to serve two neighboring cities in Ohio, another complete airport project in the South—

Hangars for transport companies in Chicago, Cleveland, Phoenix, Newark, and several other cities—

Aircraft and accessory manufacturing plants in the East and far West—

These projects just completed or under way indicate widespread activity, and are only typical of scores of similar projects handled by Austin over a period of ten years.

Austin's recognized leadership is due to unequalled experience and facilities, and national organization, which insure results to Austin's clients—good engineering, speed, reasonable cost, absolute responsibility.

For an Airport Survey and Report, or approximate costs and other information on any type of airport or aviation building project, phone the nearest Austin office, wire or send the Memo

**THE AUSTIN COMPANY, Airport Engineers and Builders**  
CLEVELAND

New York Chicago Philadelphia Detroit Cincinnati Pittsburgh St. Louis Seattle  
Portland Phoenix The Austin Company of California: Los Angeles, Oakland and San Francisco  
The Austin Company of Texas: Dallas The Austin Company of Canada, Limited

# AUSTIN

Memo to THE AUSTIN COMPANY, Cleveland—

We are interested in

☐ Airport (Municipal) (Private) containing .....acres. ☐ Hangar.....  
with .....ft. clearance. ☐ Factory approx.....sq. ft. ☐ Send me a personal copy of  
"Airports and Aviation Buildings." Name.....  
Position..... Firm..... City.....

AD 4-29







Hangar at Tulsa Airport built by B. Russell Shaw Company.

(Continued from preceding page)

mileage there are 7,566 miles of lights on 19 routes, having a total length of 9,135 miles. There are 220 lighted intermediate fields, 1,269 rotating or flashing beacon lights, while there are under contract 2,000 miles of lighting with 49 fields and 244 beacon lights. Approximately 2,000 miles more of beacon lights will be installed or contracted for by the middle of next summer.

SINCE our previous listing, the following municipalities have proposed the establishing of airports:

Newport Beach, Calif.	Denmark, S. C.
Marlboro, Mass.	Andrews, S. C.
Paducah, Ky.	Columbia, S. C.
Roswell, N. M.	Thomas, W. Va.
Belen, N. M.	

THE opening ceremonies of the Glendale airport were conducted with representatives from four air transport companies present, including Maddux, Western, Pickwick and Standard. 68 single-motored, 16 cabin single-motored, and 8 tri-motored planes took part in a parade, witnessed by aviation notables from all over the country, as well as by state and municipal executives.

The Glendale terminal, serving Los Angeles, Glendale and San Diego, is six miles from the business center of Los Angeles.

GROWING activity at the Oakland Airport is indicated by the figures for the month of January: 4,853 plane landings were recorded; 2,934 passengers carried; 556 student flights made; as compared with 2,475 landings, 900 passengers carried and 295 student flights for the same month one year previous. A forty thousand dollar hotel, 110 by 80 feet, with 37 rooms is being erected at the airport. The work of the mail clerks has increased to such an extent that three additional clerks have been added to the force. During rush periods, the single clerk, who handled the work heretofore, frequently worked from 16 to 20 hours a day.

EDWARD R. ARMSTRONG, inventor of the seadrome, who is said to have General Motors' backing, announced that the first service to be undertaken with the first model drome, now being built at Chester, Pa., will be an airline from New York to Bermuda, which should be in operation by the spring of 1930. A service between the

seadrome and Atlantic City is also contemplated. Arrangements have been made for the erection of an aircraft direction finding service at Bermuda to assist this proposed service.

Henry J. Gielow, Inc., naval architect, is coordinating the work of the Roebling Company of Trenton, N. J., which is building plate steel anchoring cable; the General Electric Company, electric power and lighting equipment; the Radio Corporation, radio beacons and direction finders; the Belmont Iron Works of Chester, Pa., steel bridgework; and the Sun Ship Building Company of Chester, which is building other parts of the Armstrong seadrome.

AN interesting arrangement has been entered into by the City of Memphis with the Standard Oil Co. of Louisiana. The oil company secures exclusive oil and gas rights to the new municipal air field of Memphis and, in return, builds a stucco administration building, a brick and steel hangar, accommodating, in addition to pilots, offices and weather bureau. In addition, the oil company will pay a hundred dollars a month for the first three and a half years for the space required for its pits and pumps and two hundred dollars a month for the second three and a half years. The cost of the buildings to be erected by the oil company is estimated at \$85,000.

NEWARK'S municipal airport has been made the eastern air mail terminus. Pending the improvement of runways to make them adequate for large trimotors, National Air Transport will continue to use its New Brunswick field, from which point the mail will be temporarily ferried to Newark by the Pitcairn Aviation. The Colonial system, linking New York and Boston and New York and Montreal, is already using the Newark airport. Considerable objection is being made to Newark's charge of one cent a pound for mail which is the basis upon which it proposed to collect from air mail operators. Considering the prospective growth of air mail, such a charge is prohibitive and promises to make airport management an altogether too profitable enterprise.

#### New Airport Projects

A CORPORATION is being formed to develop Roosevelt Field into one of the best airports in the United States. One and a half million dollars has been sub-

scribed to build two concrete and steel hangars, each 1,100 feet long; concrete aprons half a mile long and 150 feet wide; completely appointed workshop, service station, administration buildings, flood lights and boundary lights, beacons and other lighting equipment, including mooring facilities for dirigibles. Paul Lannin, president of the Lannin Realty Corporation, and a group of New York bankers are behind the project. A bus service is planned to Jamaica, a run of 40 minutes, where 103 trains daily rush to New York in about half that time.

C. S. JONES, president of the Curtiss Flying Service, reports the conclusion of arrangements to add Los Angeles, Oakland, Portland, Ore., Denver, Col., and Kansas City to the nationwide system of 25 Curtiss airports and flying fields. Six hangars and barracks for approximately 300 students will be erected by the organization at Mines Field, Los Angeles. Oakland Municipal Airport will be used at that point and a taxi service from Oakland to San Francisco, utilizing a 12-passenger, twin-motor, Sikorsky amphibian will be inaugurated. It has not been decided whether the National Guard Field or the Denver Union Field will be used by the service for its headquarters there. The negotiations at Portland call for the operation of the unit there by Tex Rankin of the Rankin Flying Service. At Kansas City, negotiations have been concluded with the Woods Brothers Corporation for the use of Fairfax Airport.

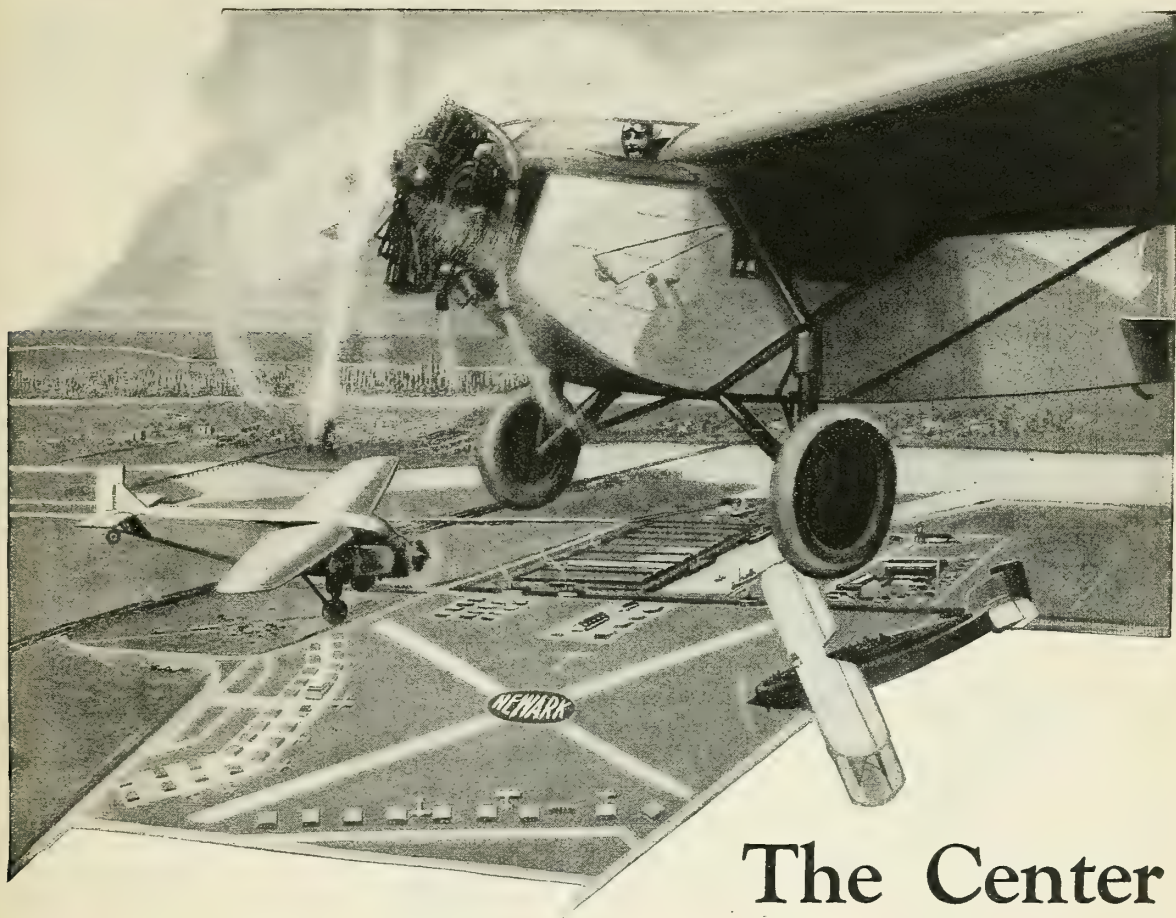
THE American Aeronautical Corporation of New York City, according to an announcement by Enea Bossi, will erect a \$1,000,000 seaplane base and air terminal at Port Washington, Long Island, on Manhasset Bay. A sixteen-acre plot has been purchased for the erection of a factory to build, sell and operate Savoia Marchetti seaplanes and amphibians under license from the Italian company. It was this type of plane which was used by Commander Francesco de Pinedo in flying across the south Atlantic.

#### With the Air Mail Services

THE United States air mail service carried 537,113 pounds of mail during December, 1928, as compared with 165,768 during the same month in 1927 and 39,350 in 1926. The increase in December, 1928, over the preceding month, amounted to 26.5 per cent.

WITH subsidies to air mail operators reaching a million dollars a month and many routes on a profitable basis, the Postmaster General is taking steps to re-negotiate some of the original contracts with a view to securing a lower rate of subsidy. On January 1 of this year, there were 31 contractors carrying mail regularly, receiving anywhere from three dollars down to 78 cents per pound, depending upon climatic and topographical conditions of the different routes. In February, 1926, the total paid

(Continued on next page)



## The Center of the Air Commerce of the East

**N**ORTH, South, and West the planes bearing the United States air mails now wing their way from Newark Metropolitan Airport. And where the air mail goes, there passenger traffic also goes, so that air travelers for Canada, New England, the Middle West and the South now take ship at the Newark Airport.

Thus in a few months, this newest and finest of Eastern airports has assumed the dominant position in aeronautical affairs to which it was destined from its very inception by virtue of its strategic location at the gateway to the most densely populated community in the United States.

Within five minutes of the heart of Newark and twenty minutes of downtown New York, the Newark Airport enjoys a "close-in" position which no other airport in the metropolitan district shares. It is the logical beginning of the "air trail to everywhere" for travelers out of New York and vicinity and the natural focal point for the Air Commerce of the Eastern United States.

Manufacturers of planes and accessories can readily grasp the practical advantage of plant location adjacent to such an outstanding center of aeronautical activity. Inquiries are invited.

JEROME T. CONGLETON, MAYOR  
NEWARK, N. J.

# NEWARK AIRPORT



(Continued from preceding page)

these operators amounted to \$466.82, as compared with over a million dollars a month, current at the present time.

**T**HE route for the Brownsville, Texas-Mexico City air mail, operated by Pan American Airways, was inaugurated March 9 when Col. Charles A. Lindbergh flew the first load of mail from Mexico City to Brownsville, Texas. He made the return trip the next day. Col. Lindbergh flew a Ford trimotor cabin monoplane, equipped with Wasp motors.

**F**IVE bids were received for the Panama to Santiago, Chile, air mail, varying between \$1.44 and \$1.98 a mile, plus 72 to 99 cents per pound for 1,000 miles. Included among the bidders were Tri-Motor Safety Airways, Inc., Consolidated Aircraft Corporation, Pan American-Grace Airways, Inc., and American International Airways, Inc.

**A**CCORDING to an announcement by the Postmaster General, the Atlanta, Ga., to Miami, Fla., route will be flown daily, except Sundays and holidays northbound and Mondays and the days following holidays southbound. The planes leave Atlanta at 6:45 southbound, reaching Miami at 1:45 p. m., with stops at Macon, Georgia, Daytona Beach, Orlando and Tampa en route. Returning, they leave Miami at 12:30 p. m., arriving in Atlanta at 7:30 p. m. By the addition of the Atlanta-Tampa-Miami route, Pitcairn Aviation has doubled its contract mileage. The distance from Atlanta to New York is 763 miles and from Atlanta to Miami, via Tampa, 777 miles.

**T**HE Bay City, Mich., to Cleveland, Ohio, contract air mail route goes into service about April 1, 1929, under the operation of the Thompson Aeronautical Corp. This is a night shift, including stops at Detroit, Pontiac, Saginaw and Bay City, and connecting with both the west and east bound trans-continental planes at Cleveland.

#### Legislation Affecting Air Travel

**T**HE Special Joint Legislative Committee on Aviation of the State of New York, headed by Senator J. Griswold Webb, presented its report on the development of aviation in that state. At the request of the committee, 74 municipalities, which are on established or proposed airways, have marked their respective names on black roofs in yellow letters from ten to twenty feet high. Ninety other cities have agreed to do the same work so that, by the end of the summer, the state should be well marked. Negotiations are under way with the Empire State Gas & Electric Association to work out some method of marking power wires which are practically invisible in bad weather. The committee is still considering the question of compulsory liability insurance for passenger carrying operators and for the rating of air flying schools. The committee has taken steps to establish a State Meteorological Service in conjunc-

tion with the United States Weather Bureau. At present, there are federal stations in Albany, Binghamton, Buffalo, Canton, Ithaca, New York City, Rochester, and Syracuse. The committee recommended the purchase of equipment for the establishment of six additional weather observatories.

**T**HE Virginia State Corporation Commission, in granting the first charter to operate an airport in Virginia, included provisions restricting flight over adjacent fields at an altitude of less than 50 feet and requiring that planes shall start their runs far enough from the boundary so that they leave the ground within 500 feet of such boundary. In landing, planes are not permitted to cross the boundary at an altitude of less than 50 feet and shall not touch the ground less than 350 feet from it. Although such regulations may be fully justified in the present development of aviation, the adoption of such specific recommendations requires either that they be later disregarded or that the certificate granted must be amended, because the seven to one gliding ratio, now considered standard, is certainly not the ultimate.

#### New Devices for Airports

**A** SUCCESSFUL employment of telexox for automatically turning on the flood lights in response to a siren signal from an approaching airplane was conducted at the Newark airport recently. As the plane approached, the field was in complete darkness, but, as the pilot turned on his siren so that a shrill, piercing wail could be heard above the roar of the motors, the telexox device automatically turned on the powerful floodlights. The telexox is a combination of microphone, sharply tuned audio-frequency amplifier and switching arrangement which closes a circuit when a note of the particular pitch to which the amplifier is tuned affects the microphone.

**T**HE Trackson all-purpose crane is especially adapted to many jobs about airports and aircraft manufacturing concerns. It has a lifting capacity of about 3,000 pounds and its operations are con-

trolled by one man. The tractor makes possible rapid movement of the crane about the job. It is useful for installing or removing motors, carrying them to and from the repair shop, and also provides a simple method of loading planes with supplies or freight. The same crane may be installed on a full-crawler tractor which is especially useful under excessively bad ground conditions, such as loose sand, gravel, mud, slippery clay, snow or ice.

**A**S a means of distinguishing airport floodlighting from brightly lighted parks and railroad yards, a new form of airport beacon has been developed by the General Electric Company and erected at the Cleveland Municipal Airport. The beacon provides a fan of light which, when rotated, reaches a pilot at any angle at which he may approach the field. One-half of this fan of light is white and the other half red. Rotation thus produces alternate red and white flashes. In cases where several airports are visible from the same point, identification must be assisted by the use of various color combinations.

**T**HE special committee of the Society of Automotive Engineers is making a study of aircraft lighting to determine battery capacity, generators, wire sizes, concentration and spread of searchlight beam, and all the factors entering into adequate lighting of the airport. The manufacturers represented upon this committee have agreed to equip six airplanes so that standard socket, voltages, cable sizes, landing-light location, illumination intensity and spread can be scientifically determined.

**A**LTHOUGH the so-called steel taped parkway cable is widely used for laying underground electric circuits, the conventional non-metallic cable is of unusual interest, according to the Rome Wire Company, because of the economy with which it may be laid and its very light weight, greatly reducing freight and handling charges. Chemical action from the soil and high cost of splicing place lead covered cables at a disadvantage with the non-metallic cable. The outer sheath is of braid and the valleys between the conductors are thoroughly filled with semi-plastic, non-inflammable material, giving a moisture seal equivalent to lead. A plow has been designed which can be pulled by the ordinary tractor, making a slit in the ground so that it is possible to lay the cable at a cost of two or three cents a foot as compared with 15 to 20 cents a foot, the cost of some other methods. On a boundary circuit alone of a 2,500-foot square airport, this means a saving of approximately \$1,300.

**A** NEW ten-kilowatt intermediate landing floodlight has been announced by the B. B. T. Corporation of America. It is equipped with a 12-inch spherical mirror, having an adjustable focal arrangement. A fan ventilator with a shutter is used and a manually operated resistor panel controls lamp voltage.



Trackson Portable Crane

# Introducing:

HOMER L. BREDOUW,  
*President*  
KENNETH V. HILLIARD,  
*Secretary*

## **BREDOUW-HILLIARD** **AEROMOTIVE CORPORATION** **Kansas City, Mo.**

**Municipal Airport—Hangar No. 4**  
**DISTRIBUTORS AND MANUFACTURING AGENTS.**  
**AUTHORIZED CAPITAL \$100,000.00**

*We're Here*  
*to give you better service!*

Our central location and splendid facilities for rendering prompt service assures you quicker delivery on parts and supplies—and in addition you know in advance that you are going to get the highest quality material. Our stock includes every item listed in the Nicholas-Beazley catalogue at the same prices.

*Approved* **WRIGHT** *Parts & Service Station*  
*Complete Stock Airplane Supplies*  
*Authorized* **NICHOLAS-BEAZLEY** *Parts and Supply Depot*  
**STANDARD OIL** *Products*

*Expert Repair and Overhaul*  
*of Planes and Engines . . . . .*

All of our service work is in charge of Kenneth "Kennie" Hilliard, who was for the past three years the chief mechanic and chief inspector for the National Air Transport Inc.

BREDOUW-HILLIARD service is maintained at the Municipal Airport, Kansas City. Shipments of parts and supplies are made from our downtown location at 604 Broadway.

Let us have the opportunity of demonstrating our better service to you. Wire or mail your order today.

**BREDOUW-HILLIARD**  
*Aeromotive Corporation*  
**KANSAS CITY, MO.**

Municipal Airport  
(5 minutes to your Hotel)

Downtown Location  
604 Broadway



# THE GREATEST OF ALL SPORTS

**F**LYING is the king of all sports. When a man once gets the feel of the air, he would rather fly an airplane the rest of his days on coffee and doughnuts than work at anything else, even though it afforded him all the luxuries of life.

There is something about flying that gets in your system and makes you want more of it after you once learn the art of conquering the air. Perhaps it is because flying is in reality an art in itself, and like other arts, is a gratifying achievement. Lovers of music, literature and the other fine arts often become so engrossed in their work from the sheer satisfaction of doing it that the monetary value placed on their efforts is of no concern to them. The greatest pleasure they get out of life is the self-satisfaction received from having created a masterpiece.

Aviation seems to have a similar enthralling atmosphere about it. Men who have dedicated their lives to its advancement have done so through the joy and satisfaction they have found in accomplishing the age-old dream of man,—to fly.

It was perhaps the sporting blood in Wilbur and Orville Wright, coupled with their ability as inventive geniuses, that prompted them just twenty-five years ago to build a machine which has transformed flight from a mere fantasy to a reality. And it has been the sporting element in the art of flying that has carried it on to its present-day achievements. Like many other things of modern life now accepted as vital accessories to man's way of doing things, aviation has proved its place in the commercial and industrial activities of the day.

But before its recognition as an efficient means of travel and its acceptance by the greatest minds of the world as an important factor in the development of the industries of all nations, it passed through a wildcat,

## By Cloyd P. Clevenger

As Told to Brent F. Cahoon

dare-devil stage. Aerial stunts took the country by storm in the early days of aviation. Plane-changing, wing-walking and a thousand other flying feats made up the programs of aerial circuses carried from one city to another by the sporting blood of the nation; and these thrills of the air met a hearty response from the general public. During these early days of flying, the big sportsmen were the promoters of aviation. Such men as August Belmont, who promoted the first aviation meet in America, brought many famous European aviators here.

Even now, as aviation is fast being woven into the commercial and industrial life of all nations, the air has lost none of its charm to those actively engaged in flying. Pilots claim that if they are out of an airplane



Back from a hunting trip.

a magnetism about flying which forever holds them. Even through the starvation period of aviation, they kept on flying for the love of it and the satisfaction they get out of the "feel of the air."

Aviators say there is an artistic touch about flying, something akin to other arts and that it is not only mental, but that there is a physical satisfaction of feeling the force of the air. If you ask a flier what he would do with a million dollars, he would tell you that he would buy a fleet of airplanes, like a horseman would establish a stable of thoroughbreds, and then just do nothing but fly over the country.

Most men in all walks of life have hobbies. With some it is horses or athletics; others find their greatest relaxation in hunting or fishing, but there are still others whose greatest joy comes from the pleasure of either piloting a plane or enjoying the air from the passenger compartment.

Many club men of various cities now use airplanes to travel to and from their country clubs. They can attend to their business up to the very last minute, and then with no discomfort whatever, step into a cabin plane and fly out to their club.

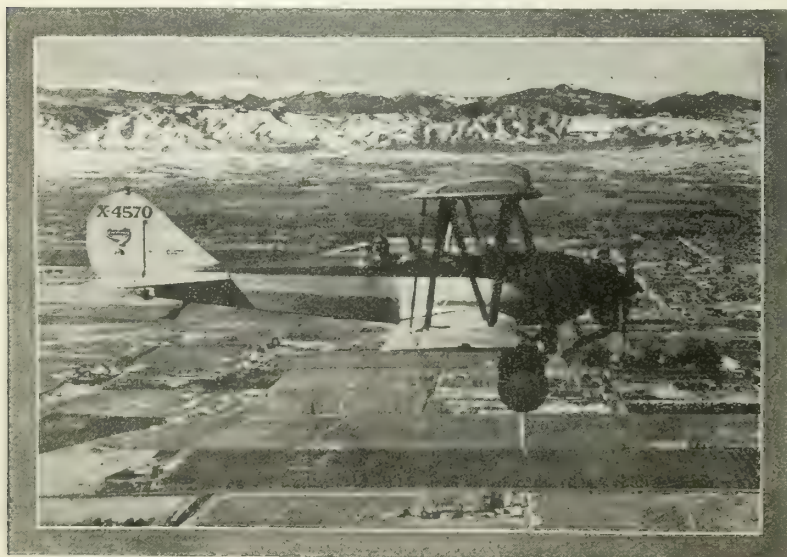
One of the greatest handicaps to big game hunting today is the barrier of distance between the business centers and the hunting spots in the mountains. The most inaccessible places are now easily reached by airplane and with considerably less fatigue than by auto or train, because there is always a spot somewhere near the hunting ground to land. In places covered by lakes, the sportsman takes a trip in a seaplane. Over the ocean, schools of fish can be "spotted" from the air; then the flying fisherman drops down to the surface of the water and casts his line from the plane.

So, with the advancement of the greatest of all means of travel now rigidly fixed as a safe, secure and speedy means of transportation, a trend of sportsmanship has led the way. The great airlines fast being established throughout the nations are merely following in the wake of the sportsman's pleasure.



A flier admires his plane.

long they begin to get fidgety and anxious to get back into the air. There seems to be



Getting the feel of the air and the glory of the Colorado scenery.





# From Pole to Pole!



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# COMMERCIAL AIRCRAFT ENGINES

Their development and testing from the point of view of safety and regulation

**N**EW types of aircraft engines are being developed in the United States in numbers much greater than at any previous time. This very sudden and marked increase in the activity of designers and builders of such engines probably arises from the fact that surplus military engines, formerly for sale at low prices, are no longer to be had. The more or less hasty production of some of these engines presents serious safety problems, which call for some effective means of regulation.

The engines largely used up to the present were first designed for military purposes. They were thus intended to meet the conditions of military service which existed at the time they were designed. The cost of these engines and the cost of up-keep were not the major concern in their design, but minimum weight and maximum reliability were sought. The number of such engines developed was limited by the fact that their financing generally depended upon government contracts or prospective government purchases, and the government naturally could not with propriety finance an unlimited number of such projects. The result has been a limited number of very excellent types of military engines of low weight per horsepower, and of very acceptable reliability, improving with time and experience of the makers, and at prices which are probably reasonable considering the quality of the product and which continually decrease with increased production, particularly where the same designs are being extensively used in civilian aircraft.

With the prospect of rapid commercial development of civilian aeronautics, this situation has changed. The first cost and the total cost per mile of commercial power plants are of prime importance; maximum performance and minimum weight are not. This has led to a demand for engines of from 50 to 200 horsepower, which is below the power range of most military engine designs. Weight per horsepower may be somewhat greater than for military engines, since extreme performance of the plane is not necessary. On the other hand, reliability of the power plant has become of even greater importance for various reasons. Although military operations necessarily involve hazards to the personnel, which often must be accepted for the sake of effectiveness in military strategy, transportation of the public must involve a practical minimum of hazard. Power plant failures in

By H. C. Dickinson

*Chief of Heat and Power Division  
National Bureau of Standards*

civil aircraft in the hands of pilots who are not especially trained in stunt flying are perhaps more liable to serious consequences than in military planes.

Commercial engines in general cannot be expected to receive the same sort of systematic care and maintenance. Moreover, the newer designs of engines have not had the advantage of long use in the hard school of military service for the elimination of faults and weaknesses, and many of the designers have had only limited experience with aircraft power plants; hence, notwithstanding the greater weight permissible, the newer engine cannot be expected to have the same degree of reliability as do the older designs.

In view of these conditions, the testing and official regulation of civilian aircraft, with especial regard to the power plant, is of vital importance.

The major importance of the power plant from a safety standpoint is emphasized by the fact that about 75 per cent of all accidents attributed to mechanical defects of the equipment are charged to the power plant, according to the latest statistics on civilian flying. Considering that the per cent of the newer and less perfected engines in use is rapidly increasing, the per cent of power plant failures and accompanying accidents may be expected to increase unless control is effectively exercised by the state and national governments.

Emphasis is laid on the strictly commercial aircraft power plant, because of the experience of the Bureau of Standards during the past nine months in the testing of these engines for the Aeronautics Branch of the Department of Commerce, as a basis for airworthiness certificates. The results of this experience throw considerable light on the difficulties encountered in the

design of new engines and suggest where progress is most needed. The type test requirements of the Department contained in the Air Commerce Regulations have recently been modified in some particulars. They provide that engines which have passed the regular endurance tests of the Army or the Navy will be approved for use in licensed aircraft and that all other engines submitted for approval will be tested at the Bureau of Standards. The present test requirements call for general specifications from the maker, including drawings of the engine together with

(Continued on page 274)

## AIRCRAFT ENGINES HAVING APPROVED TYPE CERTIFICATES (As of March 1, 1929)

KEY: 4—Number of cylinders; R—radial (arrangement); V—vee; L—in-line; A—air-cooled; W—water-cooled; and G—gear drive.

ATC No.	Description	Rated H.P.	Rated R.P.M.
1	Fairchild Camenz 447-C .....	4RA 120	960
2	Warner .....	7RA 110	1,850
3	Kinner K-5 .....	5RA 90	1,810
4	Velie .....	5RA 55	1,815
5	Curtiss Challenger R-600 .....	6RA 170	1,800
6	Curtiss Conqueror V-1550 .....	12VW 600	2,400
7	Curtiss Conqueror GV-1570 .....	12VWG 600	2,400
8	Curtiss Chieftain H-1640 .....	12RA 600	2,200
9	Aircraft Comet .....	7RA 130	1,825
10	Curtiss D-12 .....	12VW 435	2,300
11	Dayton Bear .....	4LA 76	1,425
12	LeBlond 60 .....	5RA 65	1,950
13	Wright J-5 Whirlwind .....	9RA 220	2,000
14	Pratt & Whitney Wasp .....	9RA 450	2,100
15	Pratt & Whitney Hornet .....	9RA 525	1,900
16	Axelson .....	7RA 115	1,800
17	Wright Cyclone R-1750-A .....	9RA 525	1,900
18	Packard 3A-1500 Direct .....	12VW 525	2,100
19	Packard 3A-2500 Direct .....	12VW 800	2,000
20	LeBlond 90 .....	7RA 90	1,975
21	Wright R-975 (J-6) .....	9RA 300	2,000

# THE LEBLOND

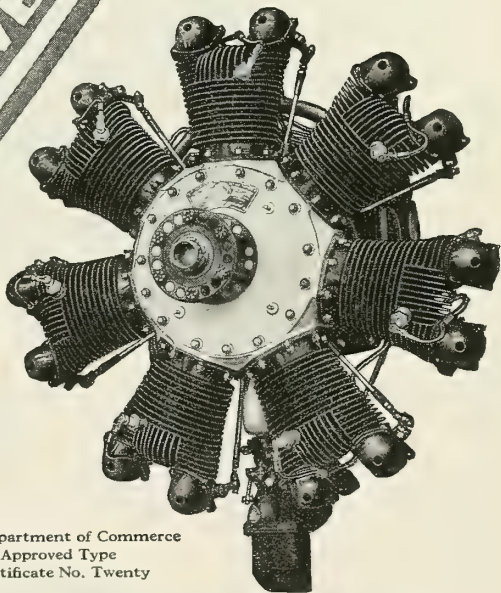
The seven-cylinder LeBlond, radial-type air-cooled, is the supreme "90" for the maker and user of two-place and three-place commercial planes. It occupies less space; offers a smooth, effortless stream of power; is easier to assemble and disassemble due to unit simplicity; costs less to operate; presents less head resistance; offers 90% interchangeability of parts with the LeBlond "60"... and is available at once.

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DEPT. D1, CINCINNATI, OHIO, U. S. A.

California Distributor: C. C. Ludlow Co.  
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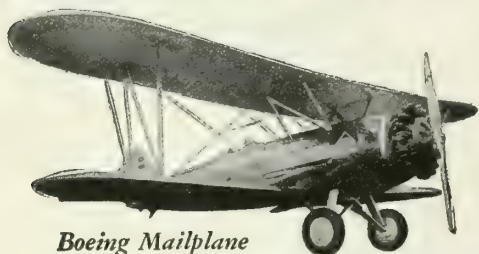


U. S. Department of Commerce  
Approved Type  
Certificate No. Twenty

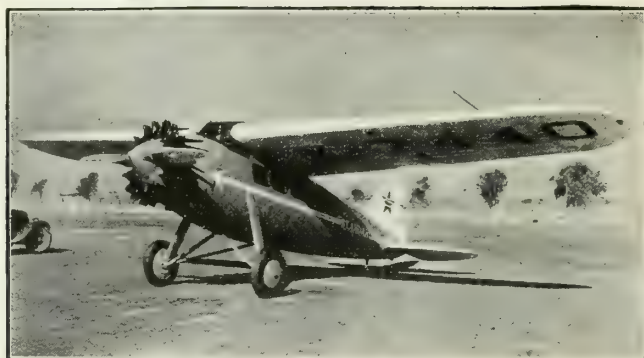
## LEBLOND AIRCRAFT ENGINES



*What can*  
**RUBBER** *contribute*  
*to the*  
**AIRCRAFT INDUSTRY?**



*Boeing Mailplane*



*Lockheed "Vega" Monoplane*



*Stinson Detrouter Monoplane*

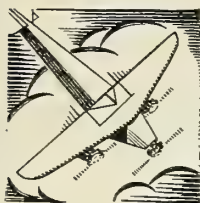
**U.S. ROYAL**  
**AIRPLANE TIRES**



Trade Mark

**United States**

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Quite a long while ago, and without making any to-do about it, the United States Rubber Company embarked on the enterprise of developing *Rubber* in the highest interests of the Aircraft Industry.

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Army and Navy specifications.

But tires are not all. This Company, besides being the Oldest Rubber Organization in America, brings to the rubber needs of Aircraft more experience in solving the rubber problems of more different lines of industry than any other rubber manufacturer.

You may expect more news of progress right along. And today, here are far-reaching contributions to the development of Aviation:—

Latex-treated Web Cord, the *lightest cord tire structure* for maximum strength.

Sprayed Rubber, the outstanding example of *purity* of Rubber in commercial quantities.

A *complete line* of U. S. Royal Airplane Tires, both Anti-Skid and Plain Tread, in all sizes for all Airplane needs.

Both Anti-Skid and Plain Tread designs in stock at strategic Branches, and at your service through U. S. Tire Dealers all over the country.

*Now ready or in development*, Rubber Specialties for all the technical requirements of Aircraft and Airport maintenance and for the human wants of Pilot, Mechanic and Passengers.

**FLY SAFE WITH U. S. RUBBER PRODUCTS**

**Rubber Company**  
NEW YORK CITY



Trade Mark



# TECHNICAL

## THE NEW WASP SERIES C ENGINE

**A** NEW Wasp engine, incorporating the experience of millions of miles of service with preceding models, has just been placed on the market. Of the twenty-one mail contractors, twelve use Wasp equipment. To date the Wasp has been used in twenty-eight different types of ship, and is standard equipment for Navy single-place fighters and two-place observation ships. The Wasp holds ten world's records, including the world's land and sea-plane altitude records.

The new Series C provides the commercial operator with a 420 horsepower power plant.

For military purposes the engine has a rating of 450 horsepower at 2,100 revolutions per minute. For high altitude work a supercharged model is available which, although rated the same at the ground, makes available this sea level power up to 5,000 feet. No additional weight is required by the supercharger. The low air resistance of this engine, together with its high power and low weight, have already made possible speeds of better than 180 miles per hour. By the use of the new types of cowling, speeds of 200 miles per hour for service ships are entirely possible.

The changes made in the Series C have been for the purpose of increasing its durability and performance, as well as decreasing the operation costs. The Series C has been extensively tested, both on the dynamometer and in service.

One of the important modifications in the Series C is the improved cylinder head design, which involves a new method of finning. Because of the improved cooling, the life of the cylinder head, as well as of the exhaust valves, has been considerably improved. A modification has been made in the shape of the exhaust valves which further increases the length of life of these parts.

Greater rigidity has been provided in the crankshaft through a redesign which increases the diameter of the crankpin and the thickness of the crank checks. The rocker arm design has been changed so that the ball bearings supporting it are carried in the rocker instead of in the cylinder. This arrangement facilitates the removal of the rocker arms and better provides for retaining the lubricant in these bearings. A slipping member has been interposed, on both military and commercial engines, between the crankshaft and the impeller drive to relieve the drive of accelerating and decelerating stresses.

A forged aluminum nose section is now being used instead of the casting formerly employed. This has practically twice the strength with a little less weight. Steel

By George J. Mead

Vice Pres., Pratt & Whitney Co.

drive gears have been substituted for dural in the magneto and pump drives. This provides for a much greater life for these parts. Reduction in operating cost has been achieved by modifications in the master rod bearing which now has a life of from two to three times that of the original bearing. This makes it unnecessary to disassemble the engine completely under five hundred hours.

Performance has been improved by the better cylinder cooling which has permitted raising the commercial rating of the engine from 400 horsepower at 1,900 revolutions per minute to 420 horsepower at 2,000 revolutions per minute. A new type of hot spot combined with a pre-heater eliminates ice formation and provides for proper distribution in cold weather. Modifications in the carburetor give much better acceleration.

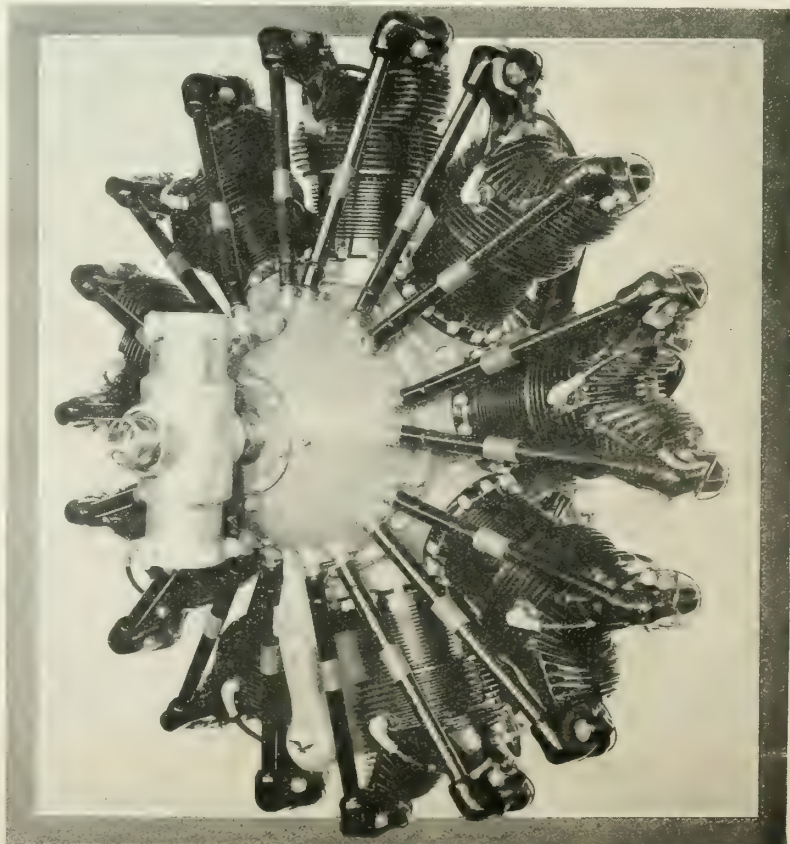
Among the miscellaneous improvements

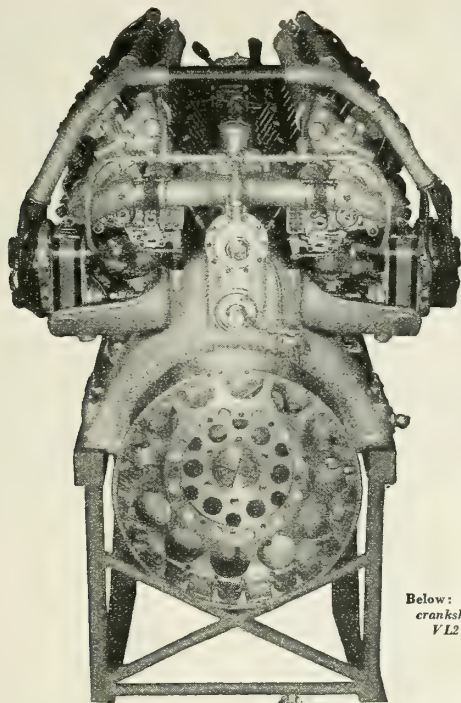
is a larger oil sump, which obviates any possibility of oil accumulating in the lower cylinders while the plane is at rest. Provision has been made for greasing the top of the push rods by means of a drill hole from the Zerk fitting on the rocker arm axle. The intake pipe flanges have been improved by a stiffening bead around the edge. A drain plug has been provided in the sump to permit of draining the oil at this point. A steel liner has been placed in the nose section to carry the thrust bearing.

A geared model of the Series C Wasp is available. After a number of years of experimentation, a beveled gear type of 2 to 1 reduction gear has been developed with automatic equalization of the pinions, so that each carries its proportion of the load. The patented features of this device have made possible a reliable and durable reduction gear which adds very little weight to the power plant.

It will be noted from the description of the changes that none of the original features which have helped to establish this

(Continued on next page)





Above: Maybach 12-cylinder, 600 H.P. airship engine, same type as engine used in "Graf Zeppelin," mfd. by Maybach Motor Co., Friedrichshafen

*Nickel Alloy  
Steel Parts in  
Maybach Engines*

...  
Crankshaft  
Connecting rods  
Camshafts  
Valve tappets  
and other parts

Below: Nickel Alloy Steel crankshaft of Maybach VL2 airship engine



Dependable materials  
are the best assurance of  
dependable performance

# MAYBACH ENGINES

in the famous "Graf Zeppelin" have Nickel Steel parts

THE remarkable performance of the Maybach engines in the record breaking transatlantic flights of the "Graf Zeppelin"—hour after hour of continuous running under the worst kind of flying conditions—demonstrated the wonderful endurance of these engines and their Nickel Alloy Steel parts.

Extensive tests have shown that the average, maximum and minimum values of Nickel Alloy Steels vary less from heat to heat than other commercial steels—that their mechanical

properties are dependably uniform. With this dependable uniformity established beyond question, practically all manufacturers of airplane engines, both in America and Europe, have adopted Nickel Alloy Steels for highly stressed parts which must have utmost dependability without excessive weight.

Information on the properties and applications of Nickel Alloy Steels will be gladly furnished by our staff of engineers. You are invited to write for additional data.

## Nickel

FOR ALLOY STEEL

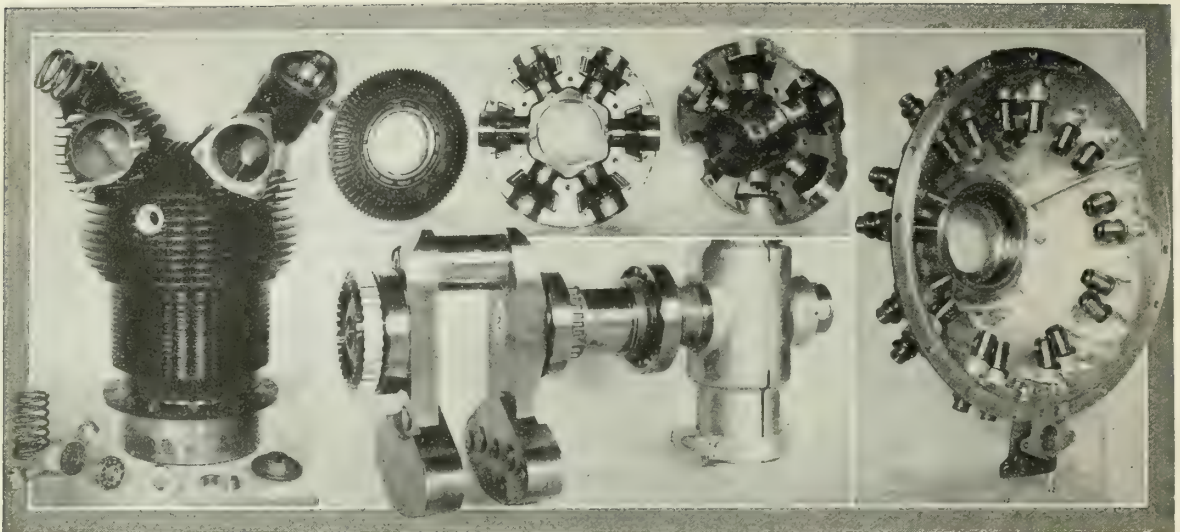
SEND FOR "BUYERS' GUIDE TO NICKEL ALLOY STEEL PRODUCTS"



THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL STREET, NEW YORK, N. Y.







Cylinder and parts, reduction gear, crankshaft assembly and forged aluminum nose section of the Series C Wasp engine.

(Continued from preceding page)

engine's reputation have been discarded. All of these have been retained, such as the forged aluminum main crankcase, enclosed valve gear carried in patented integral housings on the cylinder head, one-piece master rod and divided crankshaft, as well as location of all accessories at the rear of the engine and rotary distribution.

As a final check on the performance and durability of the Series C Wasp engine, an

official fifty-hour Navy test was run. The engine developed an average of 465 horsepower at an average speed of 2,080 revolutions per minute. The average fuel consumption was .524 pounds per horsepower per hour and the average oil consumption, .014 pounds per horsepower per hour. The dry weight of this engine was 684 pounds, which gives a weight per horsepower of 1.47 pounds. Throughout the test, no repairs or disassembly inspections were made.

The engine operated at practically full throttle for the entire period. As will be seen from the graphic report of this test, the power, as well as the fuel and oil consumptions, remained remarkably constant throughout the fifty hours. At the conclusion of the test, the engine was completely disassembled for inspection. It was found that all parts were in excellent condition and that it was only necessary to replace three piston rings and two valve springs.

## CAIRNS METAL MONOPLANE

THE accompanying illustration is the first to be published of the Cairns all-metal monoplane which is to be produced by Cairns Aircraft of Naugatuck, Conn. This entire machine except the engine and wheels is a new development. It is not possible at this time to give more than a brief outline of the salient points.

The fuselage is made of three sheets of Alclad shaped and formed by a patented process. These sheets are riveted together at the corners. No internal structure is used. The shell is of exceptional strength and rigidity. A complete report covering the static tests of this fuselage will be available for publication shortly. Besides its mechanical and physical advantages, aerodynamically it is highly efficient.

The wing used in the plane is the Cairns 79 developed during the last two years and tested at the New York University. A L/D of above 22, with small center of pressure movement is attained. As used on this plane, it is a multiple spar construction, all parts machine made.

The covering is un-corrugated Alclad screwed down with special locking means.

The landing gear is streamlined and embodies a new feature, in that the reaction from the impact of landing is taken at the trailing edge. This feature in a large measure tends to prevent nosing over when landing. The wide tread seems to provide good wing tip protection.

The tail skid is made of spring leaves attached to the fuselage with a thrust bearing.

The plane is equipped with lights in the front edge of the wing, as well as the required lighting equipment.

The model shows a two-cylinder engine as will be used on the one seater models, but the actual plane will be powered with a Wright Gipsy motor, equipped with starter and Standard Steel propeller.

The controls are all push and torque tubes; all levers heat-treated alloy castings. There are no cables or wires or external braces on the machine.

### AC INSTRUMENTS FOR AIRCRAFT

AIRPLANE instruments including tachometers, oil pressure gauges, ammeters, and oil temperature gauges have been put

into production recently by the AC Spark-plug Co., of Flint, Mich.

The new AC tachometer for airplanes is a magnetic type instrument in which effects of temperature variations are compensated for. It operates much as the AC speedometer, and is marked by simplicity of mechanism. It has but one moving part. The indicating element is swung in sapphire jewels and the magnet is formed of tungsten steel.

The Bourdon tube is the basis of the AC oil pressure gauge. This curved hollow metallic tube changes its shape with pressure, and the movement is transmitted to the instrument pointer on the face of the instrument.

Current flowing through the AC ammeter creates a variation in the magnetic field of a permanent magnet. A small piece of iron, pivoted to swing freely, aligns itself to this variation, and the pointer attached to it records the amount of current on the dial.



Wind tunnel model of the Cairns two-seater low-wing monoplane.

# ANNOUNCING THE FAMOUS WRIGHT "GIPSY"

Wright swings its engineering skill and manufacturing resources behind the perfect production of a small air-cooled engine

**I**N deciding to manufacture the famous "Gipsy" engine in America, Wright is again looking ahead and taking into consideration the next great development in aviation.

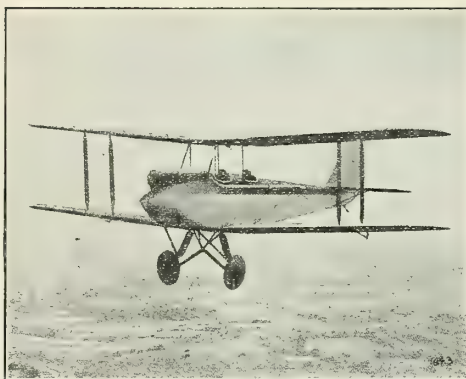
## Many Models to Choose From

Wright pioneered the air-cooled engine . . . building models of ever increasing horse power and endurance . . . until every transport requirement is met today by the three Wright Whirlwinds and the Cyclone. But Wright anticipates another great development . . . the era of the small motored, but fast "sports plane" . . . the run-about of the air lanes.

In securing the rights to manufacture the "Gipsy," Wright has acquired the world's best small engine . . . an engine with a brilliant history as its birthright.

## A Remarkable History

The first engines of the type were manufactured by the de Havilland Company in England early in 1927. There followed a series of triumphs that attracted world



wide attention . . . A "Gipsy" won the great English air classic—the 1100 mile race for the King's cup . . . Another established a new class record by climbing 20,000 feet in 70 minutes . . . Still another broke the world's light plane record by remaining aloft for 24 hours.

## High Standard at a Low Price

With the Wright "Gipsy" in quantity production late this summer, American manufacturers of light planes, and the public, will have available at last a quality low-priced engine—built to the usual high standards of Wright. Thus

the high price of first class equipment will no longer be a handicap to the individual flyer.

## General Specifications of the "Gipsy"

With alterations made by Wright to conform to American production standards, specifications of the "Gipsy" will be:

TYPE—Air cooled, four cycle, vertical.  
NO. OF CYLINDERS—4.  
BORE—4½".  
STROKE—5".  
DISPLACEMENT—318 cu. ins.  
COMPRESSION RATIO—5:1.  
GUARANTEED H.P. (Sea level)—85 @ 1900 R.P.M.  
MAXIMUM H.P. (Approx.)—100 @ 2100 R.P.M.  
FUEL CONSUMPTION (Max.)—.52 lbs. H.P./hr.  
OIL CONSUMPTION (Max.)—.010 lbs. H.P./hr.  
LENGTH OVERALL (Including Propeller Hub)—45¼".  
WIDTH BETWEEN MOUNTING PADS—11½".  
WEIGHT (no oil, but including standard equipment)—285 lbs. (Approx.).

**M**EET the Wright Company Engineers at the Detroit Aviation Show, April 6-13.

WRIGHT AERONAUTICAL CORPORATION

Paterson, New Jersey, U. S. A.



# GREAT LAKES COMMERCIAL PLANE

**T**HE six-passenger biplane, "Miss Great Lakes," recently completed and test flown at the Cleveland factory of the Great Lakes Aircraft Corporation, is a conversion of the Martin T4M-1 three purpose Navy bomber. It is constructed entirely of dural, and is powered by a Pratt and Whitney Hornet engine of 525 horsepower.

Construction on the Great Lakes biplane uses the Eureka section. Wing spars, ribs, and all parts usually made of wood are of metal, and all covering is fabric. The upper plane is supported over the fuselage by four oblique struts connecting with the fuselage on the sides, and the lower wings are fastened to the lower edge of the fuselage.

The wing tips are supported by three vertical interplane struts on each side. The wings can be folded for storage convenience. Ailerons of the Freis balanced type are used on both upper and lower wings.

All control surfaces are balanced with the exception of the elevators. Full dual control is installed in the two open cockpits above and in front of the cabin. The instrument panel includes complete navigation instruments, such as earth conductor compass, bank and turn indicator, rate of climb indicator, magnetic type compass, and instrument board lights, as well as a complete set of motor instruments and controls, including an engine bay fire extinguisher and electric starter operated from either pilot's seat.

Landing and navigation lights are installed. The landing gear is of the split axle type, with supports to the fuselage, and Oleo shock absorber struts leading vertically to the wing on each side. Brake equipment is supplied by the Bendix Company. There is a swivel tail wheel also mounted with Oleo shock absorbers. The propeller is a Standard Steel metal propeller.

The finish and furnishings of the six-passenger cabin has received much attention. It is of sound-proof construction, and is completely upholstered. Clock, cigar lighter, and vanity cases are furnished. Two baggage compartments are supplied; a space is in the rear of the cabin in the tail of the fuselage, and a larger luggage space is afforded below the front cockpit.

## Specifications

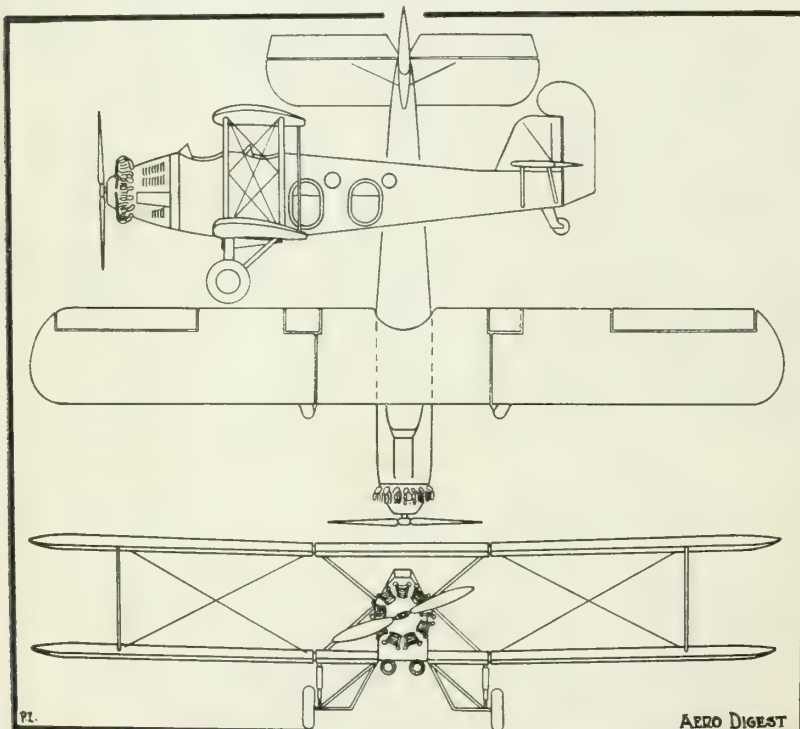
Span .....	53 feet
Length .....	33 feet 2 inches
Height .....	13 feet
Weight, empty .....	3,850 pounds
Gross weight .....	7,826 pounds
Speed .....	118 miles per hour
Landing speed .....	54 miles per hour
Engine, Pratt & Whitney Hornet ..	525 h. p.
Service ceiling .....	10,000 feet
Range, full speed .....	509 miles
Range, cruising speed .....	630 miles
Duration, full speed .....	4.42 hours
Duration, cruising speed .....	6.65 hours
Gasoline capacity .....	200 gallons
Oil capacity .....	17 gallons
Crew .....	2 Pilots
Accommodation .....	6 passengers

## N.A.C.A. TESTS ON THE PW-9 WING SECTION

**T**O obtain data on the load distribution on the PW-9 wing to be used for design purposes for the Army Air Corps, an investigation of pressure distribution on this cellule was made in the wind tunnel of the National Advisory Committee for Aeronautics.

The four conclusions of the investigation follow: 1. At angles of attack above maximum lift, the pressures on the upper wing of a biplane are decreased by the shielding action of the lower wing. 2. The burble of the lower wing of a biplane is delayed, with respect to the angle of attack, by the influence of the upper wing. 3. The overhang of the upper wing is little affected by the lower wing. 4. The center of pressure of an upper semispan of a biplane is displaced forward and outward as compared to the center of pressure of the wing as a monoplane; for the lower wing there is little difference under the different conditions.

Because of the importance of the conditions beyond the stall which affect control and stability, the investigation was carried through a range of angles of attack from minus 18 degrees to 90 degrees. The results of this investigation will be correlated with similar data obtained in flight.



Scale outline drawings of the Great Lakes six-passenger biplane.



The "Miss Great Lakes" produced by Great Lakes Aircraft Corp.




a hundred million people are looking skyward . . . and seeing different things. To some earthbound souls comes fear. Others who think themselves adventurous and daring, are thrilled. They're both misguided. The industry has no interest in them.



Another man is looking to the skies for transportation . . . He wants to save time . . . And his demands are worrying some engineers . . .



Stearman is ready for that man, with a ship that brings a light to pilots' eyes. Stable . . . agile . . . speedy, meant to *Fly*. That's a Stearman.  Engineering does it, gives a Stearman those innate characteristics which will be as exclusive and distinguished five years from now as they are today.

NOTE—Stearman Aircraft will seek those persons who are logical Stearman owners in a national, trade and export advertising program, beginning in thirty days.





# THE REARWIN KEN-ROYCE

**T**HE Rearwin Ken-Royce, the product of the R. A. Rearwin Company, Salina, Kans., is a three-place open biplane. A factory will later be built at Fairfax Airport, Kansas City, for production of the plane.

Among the features of the design are low parasite resistance, good visibility from both front and rear cockpits and a large landing angle. The first plane is powered with a Curtiss Challenger 170 horsepower engine.

The Ken-Royce was flight-tested by George Halsey. The engineering work on this model was started last June by Fred Landgraf. Production will begin just as soon as the design is approved by the Department of Commerce. This action is now pending and in the mean time jigs, tools, and machinery are being built and installed in the factory at Salina, so that just as soon as the approved type certificate is received, production will begin at the rate of one plane a week.

Structurally, the Ken-Royce is of conventional design. Wings are of wood and the fuselage is of welded steel tubing. Spars are of laminated spruce, and are not routed. Ribs are built of spruce cap strips and basswood webs. Drag ribs are made with a solid web and compression members of spruce at the top and bottom capstrip. Leading edge is of formed spruce and trailing edge of formed sheet duraluminum. The leading edge is covered with birch plywood from the bottom edge to the front spar, thereby stiffening the wing greatly. Wing tips are formed by curved steel tubing and small ribs to reduce the thickness. The ailerons which are of the Frieze type are on the upper wing only. A twenty-gallon fuel tank is carried in the root of the upper right wing, the drag loads being taken by a plywood covering on the upper and lower sides of the wing over the tank. All wing fittings are cadmium plated to prevent corrosion.

Navigation lights are built into the upper wings as standard equipment.

Fuselage is of welded chrome molybdenum and carbon steel tubing. The motor mount is detachable for adapting various motors. Fin is welded directly to the fuselage and is not adjustable. Fairing strips are of sheet duraluminum formed in a V section.

A thirty-gallon gasoline tank is placed in the fuselage in front of the passengers' seat.

The passengers' seat is wider than that of most three place biplanes. Both front and rear cockpits are upholstered in genuine Spanish leather and offer soft, luxurious seats. Cowl rolls are also made of genuine Spanish leather and are extra large.

The landing gear, which is of unique design, embodies an air-oil shock absorber of Landgraf's own design. The same type of shock absorber is used in the tail, to which can be attached either a wheel or skid. A ten-by-three-inch wheel is used on the first plane. Bendix wheels and brakes are used.

Tail surfaces on the Ken-Royce are built entirely of steel. Tubing is used for spars and torque tubes, and sheet steel formed to a channel section is used for ribs. The fin post is made strong enough to carry the entire fin and rudder load without external bracing. The stabilizer is braced by two short struts to the upper part of the fin post. This leaves the under side of the tail surfaces free of any struts or wires which might gather weeds and trash. All control masts are internal, being housed in a removable metal "stinger" which carries out the streamline shape of the fuselage. The extreme tip of the "stinger" carries the tail light.

No pulleys are used anywhere in the control system. Elevators are operated by a positive push-pull mechanism. Flexible cables are used to operate the rudder. Aileron control is by a torque tube extending from the pilot's cockpit to the middle of the upper wing. Flexible cables connect the torque tube to tee cranks out at the ailerons; push-pull tubes connect the tee cranks to the ailerons. Thus the only part in the entire control system exposed to the slipstream is the short torque tube between the fuselage and the upper wing. A duralumin streamliner is taped to this tube.

The black nose narrows down to an arrow extending back to the tail, upon which is a narrow red stripe with a pin stripe on either side next to the edge. The main part of the fuselage is Diana Cream. The read-rest is black, which extends as a black stripe down the back, over the fin and around the rudder. A black stripe also extends around the stabilizer and elevator. The wings are of International Orange. The struts and landing gear are black and wheels are orange with black striping.

## Specifications

Span, upper wing .....	35 feet
Span, lower wing .....	31 feet 6 inches
Length overall .....	25 feet
Height overall .....	9 feet 11 inches
Weight empty .....	1415 pounds
Useful load .....	875 pounds
Pay load .....	320 pounds
Gross weight loaded .....	2300 pounds
Gasoline capacity .....	50 gallons
Oil capacity .....	5 gallons
High speed .....	135 miles per hour
Cruising speed .....	107 miles per hour
Landing speed .....	45 miles per hour

## REDUCING NOISE IN CABIN AIRPLANES

**L**Ayer construction of airplane cabin walls was found to be the most practical way to reduce noise without excessive weight, according to a recent report of the Bureau of Standards. The tests were made to develop practical means of reducing noise in the cabins of airplanes.

Taking the requirements of airplane construction into consideration, the investigators found that the most practicable way to obtain a reasonable degree of quiet is to construct cabin walls in layers of light material. Such a structure gives rise to back reflection at each surface of discontinuity, thus producing a greater opacity to sound than would a homogeneous wall of the same weight. This was found also to serve as a heat insulator. The report will be distributed by the Department of Commerce.

## AIRPLANE STRESS ANALYSIS

### An Introductory Treatise

By Alexander Klemm

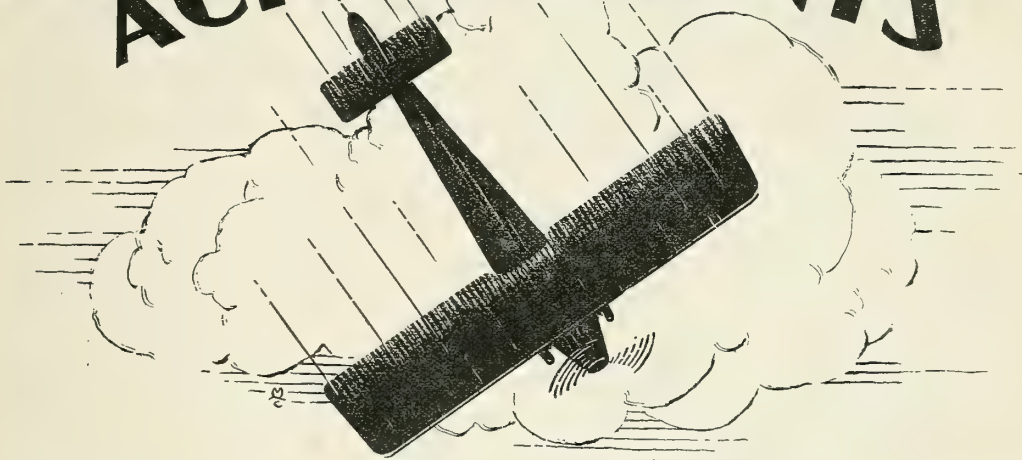
**B**EING introductory in nature, Airplane Stress Analysis by Alexander Klemm is written to meet the practical requirements of engineers, designers, and students in aeronautical engineering courses. It is written simply and clearly, and advanced mathematics has been avoided as much as possible.

This book covers the stress requirements of the Department of Commerce, particularly as regards the small commercial airplane. The rules of the Department are given in a form that can be easily understood by one making his first study of them. The principles of applied mechanics—the basis of all structural analysis—are reviewed, and the formulas thus developed are applied to the calculation of airplane stresses by using a hypothetical airplane as an illustration. All calculations are carried through a logical sequence, much as when an actual analysis is made for submission to the Department of Commerce. Information regarding the materials employed in the construction of an aircraft is included in the volume, thus giving the calculator much of the data he needs for ordinary reference in one book.



The R. A. Rearwin Co. of Salina, Kansas, produces the Ken-Royce.

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# AMOCO-GAS

*(Aviation Grade)*



# THE D A C PARASOL MONOPLANE

**T**HE D A C is a later version of the American Moth, and is now being produced by the Davis Aircraft Corporation of Richmond, Indiana.

The fuselage is of welded steel tube construction, rigidly braced. No wires are used. The section is rectangular at the fire wall, trapezoidal at the cockpits, tapering to a vertical knife edge at the rear.

The engine mount is of steel tube welded and detachable by means of four pins. Sufficient space is available in front of the aluminum fire wall for the installation of a starter.

The wing unit consists of a center section which contains the fuel tank and is supported by struts of streamlined steel. Spars are of selected spruce, and ribs of sheet duralumin. Wing panels are tapered both in plan form and in section to afford excellent aerodynamic and structural efficiency.

Drag bracing is by means of duralumin tube struts and hard wire tension members in form of Pratt trusses. Wires are doubled.

Ailerons of ample size are hinged to the auxiliary spars in a novel manner making possible an air-tight joint. Construction is similar to that of the panels.

Lift struts are of round steel tubes, faired in with ribs of a high lift airfoil section and covered with cloth. These struts have an area of slightly more than twelve square feet, thus contributing about 100 pounds of lift to the ship at a very slight increase in resistance.

Wing spars are selected airplane spruce, of two-piece laminated box type. Spars are of solid sections at points of location of important wing fittings. Large depth of spars, in conjunction with the double drag bracing tying tops and bottoms together, makes possible a very rigid structure.

Ribs are of sheet duralumin formed to channel sectioned and lightened.

The ship is covered with grade A fabric. All covers are of the slip-on type, sewed in place. Metal members are wrapped with tape before covering. Finish is comprised of five coats of clear dope and two coats of lacquer.

Shock struts and axles are of chrome molybdenum, heat-treated and faired to streamline form. Radius struts are streamlined steel tubes.

Controls are of the conventional stick and rudder bar type. Dual controls are provided.

If for any reason it is desired to render either set inoperative, this can easily and quickly be accomplished by removing one stick and disconnecting the front rudder, a matter of removing three pins, which are conveniently located. Spring clips are provided on the sides of each cockpit for reception of the sticks when so removed.

Sticks are of maple, highly finished, and are provided with rubber grips. Rock shaft is a heavy steel tube mounted on three lubricated bearings. The rudder bar is of steel tube construction carefully placed with relation to the seats.

Elevator control is by means of duralumin tube directly connected to the rock shaft unit and the elevator horn. The elevator horn is located inside the fin to reduce resistance, the latter being equipped with a pyralin inspection door to facilitate inspection.

Stabilizer is adjustable, through a range of four degrees plus and two degrees minus, by means of a lever and ratchet located on the lefthand side of the rear cockpit. Control is by means of a duralumin push rod.

Ailerons are controlled by means of duralumin tubes attached to the rock shaft lever which actuates duralumin push rods within the wings, and thence by bell cranks to the aileron horns.

Rudder is actuated by means of flexible steel cables, between the rudder bars and the horn, no pulleys being required.

Engine controls are in duplicate, the throttles and switches being on the lefthand side.

The shock absorber unit is of rubber cord. The tail skid is of the leaf spring type, producing simplicity and durability.

The tail unit or empennage was designed to provide surfaces of generous proportions, and at the same time keep weight and resistance down to reasonable figures. Spars

and edges are of steel tube and the ribs are of sheet steel, formed to section and lightened. All joints are welded and spars are reinforced where horns are attached. The vertical surfaces are internally braced, taking advantage of the deep section of the fuselage; the stabilizer and elevator are braced by means of a streamline section strut on each side, running from the lower stern post fitting up to the rear stabilizer spar. Control hinges are of the most approved strap type, reducing joint leakage and increasing safety through greater durability.

Landing gear has been placed well forward to reduce the possibility of nosing over. The structure is designed for brakes, which are supplied as optional equipment. Wheels are of the wire spoke type, 26 x 4, equipped with aluminum disc streamline covers. The six-foot tread is unusually large for a ship of this size.

The D A C is powered either with the Le Blond 60 horsepower 5-cylinder or Le Blond 90 horsepower 7-cylinder air-cooled radial type engine. These engines are equipped with dual ignition (Scintilla Magnetos). Fuel consumption is the equivalent of 15 miles per gallon.

The D A C monoplane has a factor of safety for the installation of any radial type motor up to 300 pounds in weight.

The exhaust gases are handled by a collector ring which outlets below the fuselage. This feature reduces the fire hazard, removes obnoxious fumes from the air over the cockpit, and serves to silence the engine at the same time.

The propeller is of the conventional two-blade type made by Hartzell, fitted with a spinner hub to which is attached an aluminum cap.

Fuel tank is located in the center section, away from the engine, and holds 25 gallons of gasoline. It is made of welded sheet aluminum. The feed is by gravity through copper lines. An oil tank of three gallons capacity is located in front of the fire wall just over the engine mount.

The engine and cockpits are well cowled with heavy sheet aluminum; the former are supplied with louvers to carry off gases and aid in cooling. Cockpit cowls are equipped with rolls, making the edges comfortable.

Care has been taken in designing the cockpit cowls and windshield to eliminate drafts which might become a source of annoyance while flying. The front cockpit is accessible by means of a door on the left side and conveniently located steps. Steps on the side of the fuselage are provided for the rear cockpit. Both cockpits are upholstered in handsome leather. Plywood is used for flooring.

All instruments are located in the rear cockpit. Consolidated instrument unit board is used, consisting of an altimeter, tachometer, oil pressure gauge, and oil temperature gauge, which are enclosed within a lighted panel. A battery is optional.



The Le Blond engine D A C monoplane produced by the Davis Aircraft Corp.

# MASS PRODUCTION

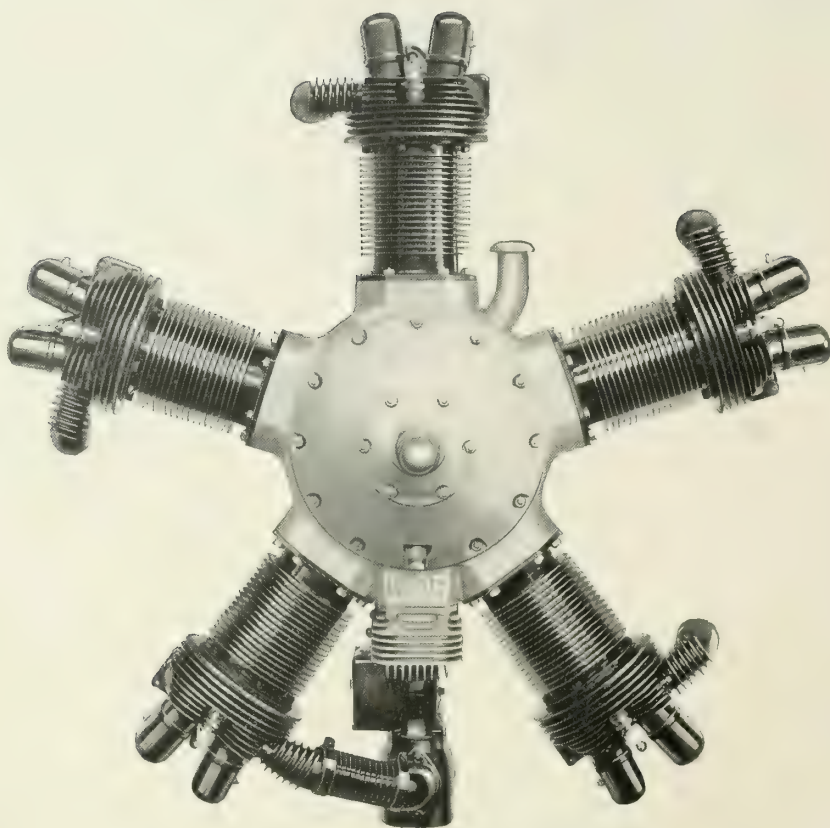


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Extra strength against torsion through plywood enclosure of leading edge, back to front spar.

Lower wings have slotted ailerons.

Box-like construction of compression ribs gives maximum rigidity.

Ribs are reinforced at top and bottom by a plywood strip running full length of each rib.

5 bays—one more than standard—give special internal bracing.

Diagonal tie rods—and rods in the slip stream—are extra heavy.

Trailing edge on top wing channelled with aluminum strip.

Fittings produced from accurate dies are minutely inspected and positively rust proof.

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This "roll call" of exclusive COMMAND-AIRE wing construction comprises a scientific guarantee of the utmost stability and control. It underwrites the visible sales appeal of sleek lines, well groomed finish, with those vital essentials that win confidence and make it permanent, and that means sales—and more sales. Write for our handsome book in colors.

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# COMMAND-AIRE





# WAXING AIRPLANES

*Experimental Data on the Skin Friction of Waxed Surfaces and a Discussion of the Practical Advantages*

By J. Vernon Steinle, Ph.D.

Research Chemist of S. C. Johnson & Son

THE individual owner of an airplane, like the individual owner of an automobile, is interested in the outward appearance and beauty of his possession as well as in its performance and superior mechanical qualities. This has been evinced by the elaborate cabin furnishings and equipment found in the larger modern planes and by the colorful exterior decoration of many of the smaller machines. The preservation of the original clean and pleasing appearance of the exterior finish should be of even more importance to the airplane owner than it is to the automobile owner. The automobile owner periodically has his car carefully washed, cleaned, and waxed to improve the appearance, to preserve the finish, and to make future adherence of dirt more difficult. If in addition to the advantages just mentioned, which are of even more importance to the airplane than to the automobile, there be aerodynamic advantages in keeping an airplane clean and waxed, a discussion of the problems involved should be of vital interest to all manufacturers of aircraft as well as to the ultimate owners.

Polished wax forms a very smooth surface. Upon microscopic examination of the cross-section of a surface finished with several coats of prepared wax and subsequently polished by friction, one can see that all of the minute irregularities of the original surface have been leveled, and that the new surface is a smooth coating of wax. A fluid passing over such a waxed surface should encounter less resistance and cause less drag on the object than on the same object if unwaxed. To determine whether or not this supposition was based on facts, experiments were conducted in the large wind tunnel at the Daniel Guggenheim School of Aeronautics of New York University.

The experiments consisted of a series of skin friction tests on surfaces formed by coating panels with normal airplane finishing materials, and on the same surfaces after applying a coating of wax over the original surface. The object on the surface of which the varied finishing materials were applied was composed of two three-ply veneer boards,  $\frac{1}{4}$  inch thick, clamped firmly on both sides of a  $\frac{1}{4}$  inch plate-glass. To obtain absolute rigidity and a perfectly flat unwarped surface, the plate-glass was found to be absolutely essential. The boards extended  $\frac{1}{4}$  inch over the edges of the plate-glass on all sides to permit the insertion of strips of wood to which the outer edges of the boards could be screwed firmly in place. The over-all dimensions of this composite object were  $\frac{3}{4}$  inch by 3 feet by 7 feet,

presenting a total flat surface area of 42 square feet exclusive of the edges. The plate was suspended in the tunnel from its top edge so that the flat surfaces were tangent to the tunnel air currents. The drag on these surfaces was measured by use of the standard three wire combination attached to each end of the plate with an automatic balance on the leading-end and a counter-weight on the trailing-end wires. The leading and trailing ends of the plate were protected by two rigidly braced streamline guards hollowed out so as to provide a slot into which the composite plate fitted. These guards served to eliminate all but a fraction of the head resistance and all but a slight amount of the sideward oscillatory motion of the plate. Friction in the guards was prevented by a  $\frac{1}{16}$  inch clearance at all points between the guards and the plate. The drag measurements were taken in the normal manner except that it was found necessary to compensate for the horizontal component of weight introduced by the slight forward or backward movement of the heavy glass plate. This was done by adjusting the length of the vertical wire on the leading-edge before each drag measurement, thus keeping a marked point on the test plate at a fixed position on the cross-hairs of a rigidly mounted telescope.

A system recommended by one of the best recognized manufacturers of airplane finishing materials was followed in preparing the boards or panels upon which the tests were conducted. Materials manufactured by this same company were employed throughout. The final coat upon which the tests for a normal finish were conducted was a colored lacquer-enamel such as is applied to all airplanes. One set of two such lacquer-finished panels was kept as a standard to be used in checking the uniformity of behavior of the instruments and apparatus, and of the constancy of tunnel conditions before and after the recorded tests were made. Upon similar sets of panels, after measuring the drag on the lacquered surface at various wind velocities, different supplementary coatings of variously formulated wax finishes

were applied, and drag measurements taken for the same series of wind velocities. The figures in Table I show the drag measurements obtained at the various wind velocities for a set of panels with the ordinary lacquer finish, and for the same panels supplemented with a coating of a specially formulated prepared paste wax. The last column in the table shows the difference in drag readings between the two surfaces on which the measurements were made.

TABLE I

Wind Velocity (m.p.h.)	Lacquer Finish Drag (lbs.)	Wax Finish Drag (lbs.)	Drag decrease (lbs.)
40	.64	.62	.02
50	.88	.86	.02
60	1.24	1.14	.10
70	1.62	1.45	.17

Of the waxes used in this series of experiments, the results obtained with only the one are shown in this paper, as succeeding practical tests proved the formulation used in obtaining these data to be the one best suited for the needs. The results can be appreciated better by examination of them graphically in Figure 1.

Although wind velocities as high as 100 miles per hour can be obtained in the tunnel, the use of speeds higher than 70 miles per hour were deemed inadvisable, because of the likelihood of breaking the plate-glass, due to the slight sideward oscillatory motion that was set up in the composite plate at higher wind velocities.

Similar skin friction tests were made, using in place of the composite plate a sheet of aluminum  $\frac{1}{8}$  inch by 3 feet by 7 feet. The guards were altered to accommodate this thinner plate. Drag measurements were taken on the bare sheet and on the sheet finished with a coating of the special prepared paste wax. Results are shown numerically in Table II and represented graphically in Figure 2.

TABLE II

Wind Velocity (m.p.h.)	Bare Aluminum Sheet Drag (lbs.)	Wax Finish Drag (lbs.)	Drag Decrease (lbs.)
40	.695	.65	.045
50	.985	.895	.09
60	1.32	1.215	.105
64	1.48	1.37	.11

The aluminum sheet was not rigid enough to stand a wind velocity of over 64 miles per hour.

The values represented in Tables I and II should not be considered as equal to the absolute skin friction on the panels, although

(Continued on next page)

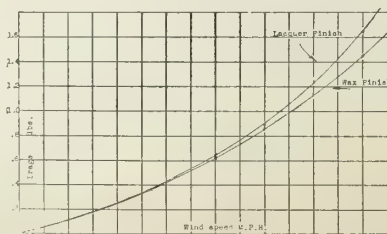


Figure 1. Lacquer finish vs. wax finish.

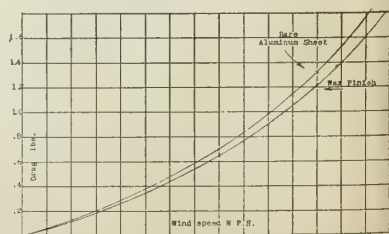


Figure 2. Bare aluminum vs. wax finish.



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Bellanca Aircraft Corporation  
New Castle, Delaware

# BELLANCA AIRCRAFT



(Continued from preceding page)

they are close to this. There are several factors affecting the drag, such as: the presence of the rather rough top and bottom edges of the plate, the lack of an accurate determination of the drag on the wires, and the existence of a somewhat greater air pressure between the trailing-edge and the rear guard than between the leading-edge and the front guard. (This would decrease the drag as measured—the fluctuating back pressure in the trailing-end guard was relieved by perforating the rear part at several points.) On the other hand, these factors do not in any way invalidate the comparative study of the finishes, for there is only one factor that has been varied in making the two sets of drag measurements shown in the tables. The only variable is the alteration of the surface of the panels by the addition of a coating of wax to the surfaces already studied.

The question of skin friction and the effect of it on the flight of a plane has been a question of debate in the discussion of aerodynamics since the days of Langley's first experiments, when he stated that skin friction played but a slight part in the total resistance on a plane. Since that time various opinions have been held by different authors, some agreeing with Langley, others, like Leonard Baird in his "Applied Aerodynamics," stating that as high as 40 per cent of the total resistance of a plane may be attributed to skin friction. Various investigators have attempted to make direct measurements of skin friction on different surfaces. Classic among these investigations are Froude's experiments in water as a fluid of medium, and Zahn's experiments in air. The latest and most accurate measurements taken are those made in 1915 by Willis A. Gibbons and published under the title of "Skin Friction of Various Surfaces in Air." These experiments all show a difference between the skin friction of surfaces of varying degrees of smoothness. Because of these experimental data, it is considered by many that the skin friction of a body, even for one having a very smooth surface, varies with the character of that surface. On the other hand, many support the opinion of F. W. Lanchester. The theory, that there is no slipping of a fluid past the surface of a solid, but that the film adjacent to the surface adheres to it, is generally accepted. Those supporting Lanchester, however, interpret this to mean that all of the resistance experienced is of the nature of a viscous drag.

From the data shown above I am forced to believe that, to some degree at least, the nature of the surface, even of an object having a very smooth surface, affects skin friction. The tables show that at so comparatively low a wind velocity as 60 miles per hour the difference in skin friction on the test panels due to the application of a wax finish is .1 pound for the lacquered surface and .105 pound for the aluminum surface. For the lacquered surface, this means a decrease of 2.381 pounds of resistance per 1,000

square feet of surface at 60 miles per hour. Figures 1 and 2 each show that the drag curves for the waxed surfaces are diverging rapidly from the curves for the normal surfaces as the wind velocity increases, and it is reasonable to believe that this divergence may continue in the same degree.

Too great a personal error would be involved in an attempt accurately to extrapolate the curves in Figures 1 and 2. It can readily be supposed, however, that by a continuation of the curves at the same angle of divergence held in the experimental limits, that the decrease of the resistance at an air speed of 100 miles per hour would be quite appreciable and that the corresponding saving of power would be very advantageous.

The aerodynamic advantage derived from the decrease of resistance brought about by the lowering of the skin friction is by no means the only outstanding reason for the use of wax on an airplane. Extended weather tests on both lacquer and varnish finishes have proved that a protective coating of wax prevents the destructive action of the sunlight and rain to a marked degree. Wax is chemically inert and, therefore, is not changed in any manner by the continuous action of the oxygen of the air, as are most other types of finishing materials. The slow disintegration due to oxidation is prevented by wax.

A supplementary wax finish prevents the adherence of dirt and makes subsequent cleaning much easier. The enhanced appearance resulting from the beautiful soft sheen imparted by wax to a lacquered or varnished surface has been a great factor in increasing the use of wax on automobiles, and should prove to be of equal importance in establishing its use on airplanes. Prepared wax should not be confused with the common type of automobile or furniture polish, consisting primarily of oil, which imparts a temporary lustre to the finished surface. The essential feature in the accomplishment of the results mentioned herein is the deposition on the surface of the plane of a coating of solid wax that subsequently can be smoothed by the friction of polishing.

The total weight added to the plane by the application of two coats of prepared paste wax is less than 1¼ pounds per 1,000 square feet of surface. Even this slight weight is more than offset by the removal of the dirt in the cleaning operation, or if the plane be new, by the prevention of the adherence of dirt.

There are both physical and chemical reasons for believing that wax may prevent ice formation on the leading-edge of an airplane wing. The very smooth surface presented by the wax finish, as proved by the skin friction tests, will tend to allow the water or sleet to slip off before it can adhere to the plane. Chemically water and wax are very unsimilar; they have no attraction for each other to form chemical compounds nor have they even a tendency because of chemical similarity to go into mutual solution; in fact, there is a distinct chemical repulsion of wax for water. It is hoped, therefore, that experiments may prove that a wax finish will at least retard the speed of ice

formation on airplane wings. Experiments for the purpose of studying this question are being contemplated and the results will be published when completed.

Aside from the possibility of retarding ice formation, the facts herein presented should clearly demonstrate both to the manufacturers and to the owners of airplanes the advantages of a supplementary coating of wax over the normal finish.

(The author wishes to acknowledge the assistance of Professor Alexander Klemin in the planning of the skin friction experiments, and of Mr. B. Demidoff in the active accomplishment of the tunnel tests.)

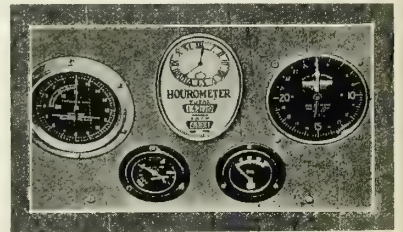
## THE HOUROMETER

By HOWARD V. WALDORF

A TIMING device, designed to record accurately the flying time of an airplane, has been invented by two Oakland, Calif., youths.

The inventors are Eugene P. Fraser and Malcolm C. Elrick. The device, known as an hourometer, fastens onto the instrument board, and resembles an automobile speedometer. Separate divisions of the dial of the instrument give the trip flying time and the total flying time.

A trigger, attached to the landing gear starts the timing device the moment the plane leaves the ground and stops it when the land-



ing is made. Spreading and contracting of the landing gear actuates the trigger, which opens and closes an electrical circuit. Current for the circuit is supplied by two dry cells or from the generator.

The device, designed especially for flying schools and air transport companies, has been successfully tested at the Oakland Municipal Airport in a plane piloted by George McCallum of the Oakland Flying Club.

## CYCLONE ENGINE TEST

DEVELOPING 560 horsepower at 2,100 revolutions per minute, the Wright Cyclone engine was accredited the highest power output ever given by the Navy Department for a geared radial engine, in tests at the Naval Aircraft Factory in Philadelphia recently.

The gear ratio used was two to one. By gearing the transmission of power from crankshaft to the propeller, a large, low speed propeller may be used, instead of the small, high-speed one for direct drive. Geared engines give a higher performance in taking off and climbing with loads. The Cyclone engine showed no injury from the full-throttle running when inspected later.

<sup>1</sup> First Annual Report of the National Advisory Committee for Aeronautics. Report No. 6, Part 2, pp. 176-184, 5th ed.

See the

# SCINTILLA

AIRCRAFT

MAGNETOS

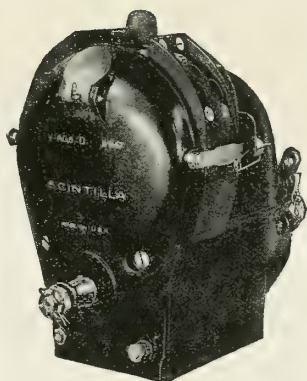
**Scintilla Aircraft  
Magnetos are  
standard with  
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*They are selected because  
of their*

DEPENDABILITY  
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ACCESSIBILITY

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**DETROIT  
SHOW**

RECORD maker in most all history-making flights. During the record endurance flight of the "QUESTION MARK", six Scintilla Aircraft Magnetos produced 376,650,000 unflinching sparks, proving the thoroughness of inspection and testing at plant.

*Scintilla Aircraft Magnetos  
can be obtained for engines of  
from one to eighteen cylinders.*

**The majority of modern  
American Aeronautical  
Engines are equipped  
with Scintilla Magnetos.**



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# HIGH POWERED AIRCRAFT ENGINES

BY ENEA BOSSI, Pres., AMERICAN AERONAUTICAL Corp.

**T**WO tendencies may be noted today in the manufacture and development of aviation engines—the one is the design of small, efficient, and inexpensive power plants to be used for sport and touring planes, the other is the tendency towards more powerful and reliable power installations for transports, mail, and commercial craft.

As far as the first is concerned, I believe that the light sport plane of the future will have a motor developing between 80 and 100 horsepower, since a reserve of power is essential and necessary to cope with all unforeseen air conditions.

However, in regard to power plants which are necessary in large multi-motored commercial ships, one of the first requisites in any service which will carry passengers and valuable freight is not only great efficiency, but great reserve of power and reliability. The leading airplane engine manufacturers of the world have developed, or are developing, engines which range from 500 horsepower up to 1,000 and 1,250 horsepower. Although these powerful engines are of very sturdy construction, they develop more horsepower per pound in proportion to their size than the smaller ones.

As automobile races have done in the past, annual airplane racing competitions, such as the Schneider Cup races, in presenting special problems both to the designers of planes and to the designers of engines, accomplish a great deal by stimulating the testing and experimenting of new steels, new alloys, new methods of design which will eventually find general application in commercial engines.

For instance, among the new alloys for crankcases, camshaft housings, etc., is an aluminum and magnesium alloy known as electron. This material is being extensively used by one of the leading European engine-

manufacturers, the Italian Isotta-Fraschini. As compared to aluminum, its weight ratio is 1.8 to 3, with twice the former's tensile strength. This alloy can be forged and cast. In its own foundry, the Isotta is casting wheels and axles for street cars in electron, which is a proof of the remarkable workable qualities of this new alloy as well as of its strength.

The United States, which has been leading the world in the manufacture of engines for automobiles and which has developed the powerful radial aviation engine, has not as yet entered into the commercial production of engines of 1,000 horsepower or more. To my knowledge the Packard Motor Car Company is the only one which has built and tested a motor of such power, the 24-cylinder X motor which was built for Lt. Al Williams' Schneider Cup racer. In Europe, on the other hand, the British Napier Lion and Isotta Asso 1,000 have been and are in use for bombing and commercial planes and will be used more and more in the future.

The question of high power is of great importance when one considers the motor installation on seaplanes, because a great reserve of power is necessary to take off on rough water. Landings and take-offs are not always from a smooth river or lake; a big passenger-carrier may be forced down by unforeseen circumstances on the ocean, and, after repairs, must be able to take off with its load of passengers and continue to its destination. An adequate reserve power renders this possible, in the same way as big ocean liners with powerful engines can more easily and with greater speed force their way through and over the waves of the oceans.

Because of the foregoing considerations, I am convinced that the future of multi-motored commercial transports largely depends on bigger and more powerful engines.

## RECENT PATENTS

**T**HE following patents of interest to readers of *AERO DIGEST* were issued recently from the United States Patent Office. Copies thereof may be obtained from R. E. Burnham, patent and trade-mark attorney, Continental Trust Building, Washington, D. C., at the rate of 20c each. State number of patent and name of inventor when ordering.

Door-locking equipment for cabin-type aircraft. Frank E. Casey, Chicago, Ill., assignor to National Pneumatic Co., New York, N. Y. (1,701,491)

Road or course indicator for motor-vehicles, vessels, aircraft, or the like. George Mengden, Melz-sur-Seine, France. (1,701,582)

Compass variometer. Louis A. Bauer, Washington, D. C., and William J. Peters and John A. Fleming, Chevy Chase, Md., assignors to Carnegie Institution of Washington. (1,701,603)

Helicopter-control mechanism. Harold F. Pitcairn, Bryn Athyn, Pa. (1,701,762)

Wireless direction-finding apparatus. Cecil Davis, Glasgow, Scotland, assignor to Radio Corporation of America. (1,702,041)

Flying-machine. Walter T. Davis, Wheeling, W. Va. (1,702,109)

Piece of Ordnance particularly adapted for firing upon aircraft. Nicholas Emilien Methelin, Paris, France, assignor to Schneider & Cie., same place. (1,702,167)

Control-gear for aircraft. Cyril F. Uwins, Clifton, England, assignor to Bristol Aeroplane Co., Ltd., Bristol, England. (1,702,184)

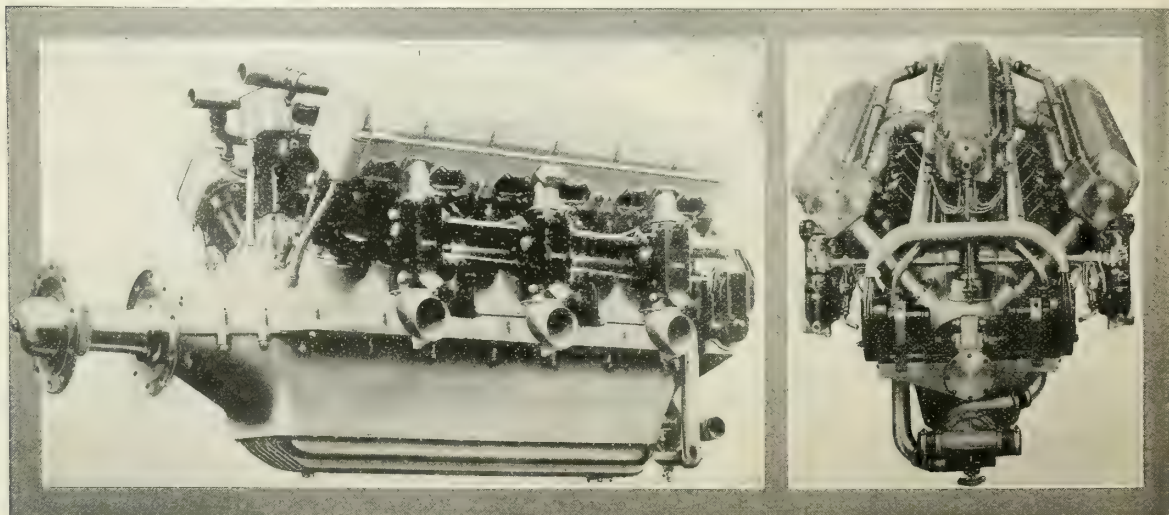
Aircraft refrigerator. George F. Bosch, Mount Vernon, N. Y. (1,702,194)

Airplane. Robert V. Morse, Ithaca, N. Y. (1,702,306)

Parachute equipment for aeroplanes. Stephen F. Stevens, Rumson, N. J. (1,702,422)

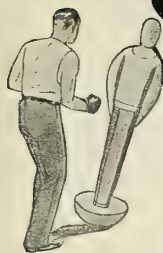
Flying-boat hull. Daniel J. Brimm, Jr., West Hempstead, N. Y., assignor to Ireland Aircraft, Inc. (1,702,533)

(Continued on next page)

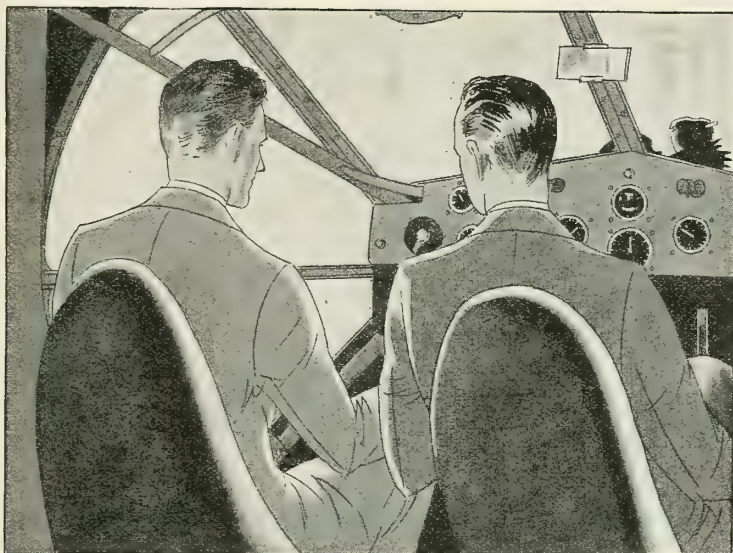


One of the most powerful power units for its size in the world, the 1000 h.p. Isotta engine.

# STABILITY *versus* BALANCE



The inherent stability of the Ryan is like the "come-back" of the boxing dummy



Heretofore, aircraft balance has been as precarious as a juggler's trick

**T**AKE the stick and convince yourself regarding the new Ryan Brougham for Six. You will agree that its ease of handling, stability and sureness of control widen the margin of superiority which the world concedes to Ryan.

You will grasp the difference between merely a delicately balanced ship that will fly "hands off" only after a close adjustment of the stabilizer, and the new Ryan which comes back smoothly, automatically, and with certainty after being deliberately forced out of normal flight.

The Ryan differential aileron control is so quick and smooth that it is best left alone, in fact, the ship will bank automatically if the rudder is used and can be easily steered by the ailerons. Directional control has been perfected to a degree that is a delight to mail pilots and other cross-country flyers.

To meet the new Ryan production schedule, now in full swing at the St. Louis plant, contract has been let for more than a million and a quarter dollars' worth of the new Wright Whirlwind 300 horsepower J-6 engines.

Early deliveries of the new Brougham are now obtainable through Ryan distributors at principal airports throughout this country and abroad. Write for new illustrated catalog.

THE MAHONEY-RYAN AIRCRAFT CORP'N  
LAMBERT-ST. LOUIS AIRPORT  
ANGLUM, ST. LOUIS COUNTY, MISSOURI



P. De C. Ball, President and Chairman of Ryan Board, Col. Charles A. Lindbergh and J. J. "Red" Harrigan, photographed after Col. Lindbergh's recent test flight in the new Ryan

## The New RYAN BROUGHAM for Six

SISTER SHIP OF THE "SPIRIT OF ST. LOUIS"



(Continued from preceding page)

Aeroplane. Caesar Gida and Leo Jacopi, Colma, Cal. (1,702,634)

Steerage of winged aircraft. Adolf Ehrlich, Budapest, Hungary. (1,702,645)

Automatic ground release for aeroplanes. Charles D. Carey, Channing, Mich. (1,702,682)

Parachute. Giuseppe Furmanik, Rome, Italy, assignor to Giacomo Achille Calabi, same place. (1,703,001)

Aeroplane landing-gear. Daniel J. Brimm, Jr., West Hempstead, N. Y., assignor to Ireland Aircraft, Inc. (1,703,222)

Airplane power-dusting apparatus. Elmer

Johnson, Washington, D. C., dedicated to the public. (1,703,308)

Aeroplane. Elias A. Kauffman, Chicago, Ill. (1,703,396)

Start of flying machines. Hugo Junkers, Dessau, Germany. (1,703,488)

Aircraft heater. Aristides S. Carouso, Flushing, N. Y. (1,703,612)

Flying-machine. Alvah Haworth, Long Beach, Cal. (1,703,621)

Aeroplane-dolly. Luis Azarraga, Hempstead, N. Y. (1,703,652)

Echelon-plane airship. Augustus J. Harpstrite, Los Angeles, Cal. (1,700,290)

Compass for aircraft. Pierre Escallier,

Lyon, France. (1,701,034)

Airship. Otto K. Quast, Spokane, Wash. (1,701,116)

Aircraft communication apparatus. Louis O. Glatzner, Hasbrouck Heights, N. J. (1,701,204)

Aeroplane. John Dill, N. Y. (1,701,298)

Aircraft. Rogelio Garcia, New York, N. Y. (1,701,407)

Airplane. Randolph F. Hall and Charles A. Phillips, Ithaca, N. Y., assignors of three-fourths to said Randolph F. Hall, and one-fourth to Theodore P. Hall, Wallingford, Conn. (1,701,451)

(To be continued each month)

## THE RENARD W-T-5 AIRCRAFT ENGINE

**W**RIGHT-TUTTLE Aircraft Motors Corporation of Anderson, Indiana, has acquired the exclusive rights to manufacture and distribute the W-T-5 Renard motor in the United States, and its possessions, Mexico and Cuba, from the Renard Aviation and Motor Company of Brussels, Belgium.

The motor was designed seven years ago by Alfred Renard, who was at that time chief engineer of the Belgian government aeronautical laboratories. The motor was developed for the Belgian government for training purposes and light military work, stress being laid on its simplicity of construction with features of speed, power and low cost of maintenance. It is a 5-cylinder radial air-cooled type.

Among the features of this motor are the facts that it has less than 200 parts in its construction, develops 100 horsepower, according to block test, at 1,400 r.p.m., 120 horsepower at 1,580 r.p.m., and 145 horsepower at 1,750 r.p.m.

The motor is of simple, sturdy construction throughout and is exceedingly light in weight, being only 21½ pounds per horsepower, including propeller hub and two Scintilla magnetos.

The diameter overall is 42.5 inches and the length overall is 23.5 inches.

The motor is lubricated by a dry sump system, double oil pump, with one lubricating and one scavenging pump. There are two valves to each cylinder. Dual ignition timing is adjustable from 0 to 35 degrees.

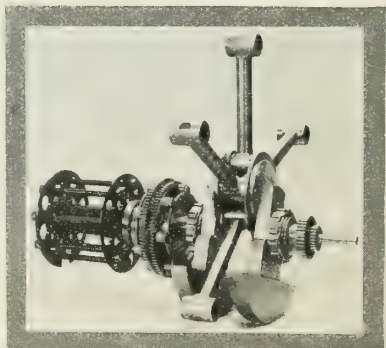
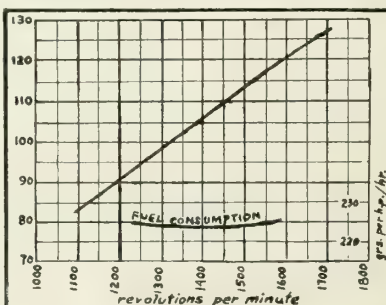
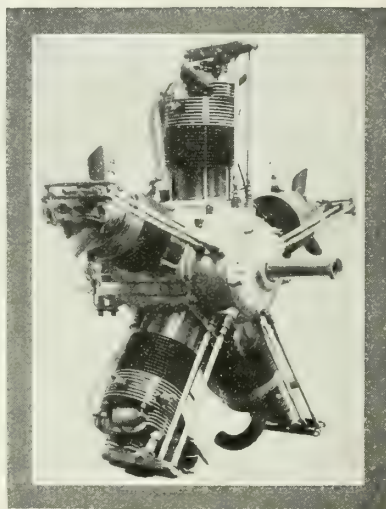
The cylinders are lathe machined from special steel forgings, the cylinder head being die cast of special aluminum alloy with forged aluminum bronze seats for valves and spark plugs. The cylinder is easily removed for valve grinding or inspection. The pistons are uniquely designed and constructed of aluminum alloy.

The valves are constructed by a special heat resisting alloy with double valve springs.

The valve operating mechanism consists of straight push rods of duralumin tubing and rocker arms mounted on ball bearings.

The connecting rod assembly is a unique invention of Mr. Renard, being an application of master rod with four articulating rods constructed of special alloy steel counterweighted to perfect balance.

The crankshaft is one-piece machined from alloy steel forgings mounted on two roller



Crankshaft assembly, W-T-5 engine.

bearings and with front thrust ball bearing. The crankcase features three parts of cast aluminum alloy patterned for strength, but of extremely light weight.

The motor was flight tested by Jimmy Collins, chief test pilot for Curtiss Company at Curtiss Field on January 8th, by Mr. James B. Taylor, president of Air Associates, Inc., New York City, and also by Capt. Glenn M. Pike, president of Aeronautical Engineering Company of New York City. They commented very favorably on the vibrationless features of the motor, its simplicity, and its unique valve operating mechanism.

A factory having a floor space of 72,000 square feet has been purchased at Anderson, Indiana, with a maximum output of 5,000 motors per year. The W-T-5 motor is particularly adaptable for 2 and 3-place ships.

General specifications of W-T-5 Type 100 radial air-cooled aircraft motor, are as follows:

Number of cylinders.....	5 fixed radial
Bore.....	4.75 inches
Stroke.....	5.50 inches
Compression ratio.....	5:2
Surface of the piston.....	17.5 square inches
Piston displacement, each.....	.965 cubic inches
Total piston displacement.....	.482 cubic inches
Weight in running order complete with propeller hub and two magnetos....	27.5 pounds
Diameter, over all.....	42.5 inches
Length, over all.....	23.5 inches
Propeller speed.....	same
as the crank shaft—no reduction gear	
Direction of rotation.....	clockwise
Weight per horsepower.....	about 2.20 pounds
Average torque.55 Kgr./M—398 pounds/foot	
Gas consumption per horsepower/hour.....	0.503 pounds
Oil consumption per horsepower/hour.....	0.022 pounds
Ignition.....	dual by Scintilla magnetos
Carburetor.....	single
Starting....	by hand (booster) magneto or mechanical starter on special order
Cooling system.....	air-cooled
Lubrication.....	dry sump system—double oil pump, one lubricating and one scavenging pump
Number of valves.....	2 per cylinder
Timing of ignition.....	adjustable from 0 to 35 degrees

# PROOF

Words, ads, sales talk—these do not convince. In the final analysis, it is PERFORMANCE that clinches the sale. When Stromberg sets out to convince you of its merits, it needs no greater proof than the achievements listed below.

## *Stromberg Carburetors Used in Creating Every Record Shown Here*

- Cross Country Flight—Los Angeles to Roosevelt Field, L. I., Frank Hawks in Lockheed Vega plane—18 hrs. 21 min, 59 sec..... 1929
- Endurance Flying Record—Army plane "Question Mark"—Maj. Carl Spatz, Commanding Officer—in the air over 150 hours..... 1929
- Flight to North Pole—Capt. G. H. Wilkins 1928
- Washington, D. C. to Mexico City—Col. Chas. A. Lindbergh..... 1928
- Oakland, California, to Australia—3 hops—Capt. Kingsford-Smith..... 1928
- Trepassy, N. F., to Wales, England—Amelia Earhart, Wilmer Stultz, Louis Gordon ..... 1928
- New York to Paris in his now famous "Spirit of St. Louis"—Col. Chas. A. Lindbergh ..... 1927
- New York to Berlin and previously an endurance record—Clarence Chamberlin ..... 1927
- New York to France—Com. R. E. Byrd.. 1927
- Winner of Dole Flight—Oakland, California to Honolulu—Art Goebel, Lt. Davis ..... 1927
- Flight to North Pole—Com. R. E. Byrd 1926
- All Three Winners Reliability Tour—1st, Travel Air, Walter Beech, Pilot—2nd, Buhl-Verville-Custer—3rd, Wright J-4, Stinson, Pilot..... 1926

See our Exhibit  
At the Detroit  
Aircraft Show  
April 6th - 14th

See our Exhibit  
At the Detroit  
Aircraft Show  
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STROMBERG MOTOR DEVICES CO., 58-68 E. 25TH ST., CHICAGO, ILL.



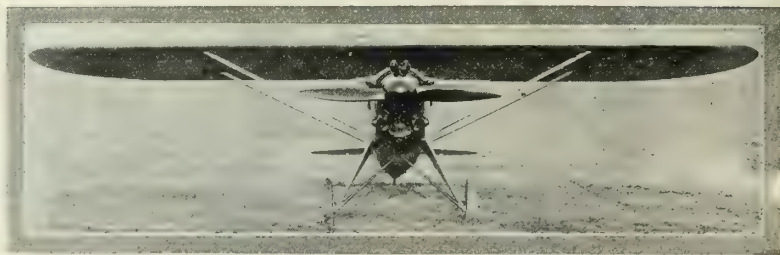
# ORIOLE SPORT PLANE

**T**HE new Oriole, manufactured by the Doyle Aero Corporation, of Baltimore, Maryland, has the same general flying qualities as larger monoplanes, possessing the required structural strength for all maneuvers to which any commercial ship will be subjected. The ship is powered with a LeBlond 60 engine. In stalls, according to the producer's claims, the nose drops with no tendency to spin, and when deliberately put into a spin, it revolves rapidly but with nose well down. Recovery is immediate when the controls are centered. Before being placed on the market, the Oriole was thoroughly tested for several months.

With an adequate layout of machinery installed and complete sets of accurate and carefully made jigs, proving their value in speedy final assembly and all parts fitting freely, production is now going forward in a small but modern plant. Several ships have been produced to date and the plane is now getting well under way on a production line schedule of one ship per week through the spring.

The wing is made in two halves joined at the cabane with quickly removable metal fairing strip to cover the opening. Spars are of selected spruce, the rear ones being a full rectangular section and the front one being routed between fittings. Ribs are built up of spruce strips with reinforcing plywood gussets, which are glued and tacked in place. The true contour of the leading edge is maintained by a thin sheet of duralumin. The standard drag strut is a welded steel tube truss with fittings for the conventional hard wire internal drag bracing. Double drag wires are used and have been kept as far apart as possible to insure the utmost rigidity in the unbraced portion of the wing. An aluminum tube gives the wing tip its elliptical shape. In the root of each wing there is a 12½-gallon welded aluminum gasoline tank, with shut-off valve where it can be conveniently reached from the cockpit. Wing struts are of large diameter steel tubing faired with balsa wood.

Fuselage skeleton is of seamless steel tubing welded at all joints to form a single unit. Since all major fittings are located in



Front view of the Le Blond engined Doyle Oriole monoplane designed for sport use.

the master jig, tail surfaces, struts, landing gear, etc., are interchangeable. The cabane structure is welded directly to the fuselage and designed to take loads that ordinarily go through the left top longeron, the latter in this case being cut out for the door. All major joints and fittings are sufficiently over-strength to withstand without damage minor accidents to wings, tail surfaces or landing gear. The fuselage structure is faired to streamline form with sheet dural and the whole fuselage is covered with fabric. Easy access to the front seat is insured by a large door opening the full depth of the fuselage. Both cockpits have been kept as clean as possible. The control wires to the rudder are concealed within the side upholstery and the torque tube between the sticks is under the floor. Dual controls (including sticks, rudder pedals, and throttles) are standard equipment. Either set of controls can be quickly disconnected. The sides of the fuselage and the seats are well upholstered. The latter have cushions that can be removed when a parachute is to be used. A full set of instruments is standard in the rear cockpit, with an altimeter only in the front one. When the ship is to be used for school work, a full set of instruments can be included in the front board.

The cowl around the motor is in two sections held in place by automobile type latches. The landing gear is of welded chrome molybdenum tubing, with the outside structure faired with fabric. Rubber cord shock absorbers are used. The axle strut with one bearing at the top is the only moving part of the gear. It is also of chrome molybdenum and is heat treated.

Wheels are streamlined with spun aluminum discs. Tail surfaces are also jig built. Tubing is used for front and rear spars, and ribs are formed of sheet steel. A spring tail skid is used. It is a high wing design, with the wing above the fuselage.

Standard color is black and the special Doyle aero yellow. Other color schemes can be had on special order. Berry Brothers dopes and lacquers are used throughout and are applied by the new Berry process.

## Specifications

Span .....	30 feet
Wing area .....	165 square feet
Length .....	19 feet
Weight, empty .....	780 pounds
Weight, loaded .....	1,280 pounds
High speed .....	103 miles per hour
Landing speed .....	41 miles per hour
Power.....	.65 h.p. at 1950 r.p.m.
Fuel consumption ..	5 gallons per hour
Fuel capacity .....	25 gallons
Oil capacity .....	3 gallons

## AIRCRAFT PROPELLERS

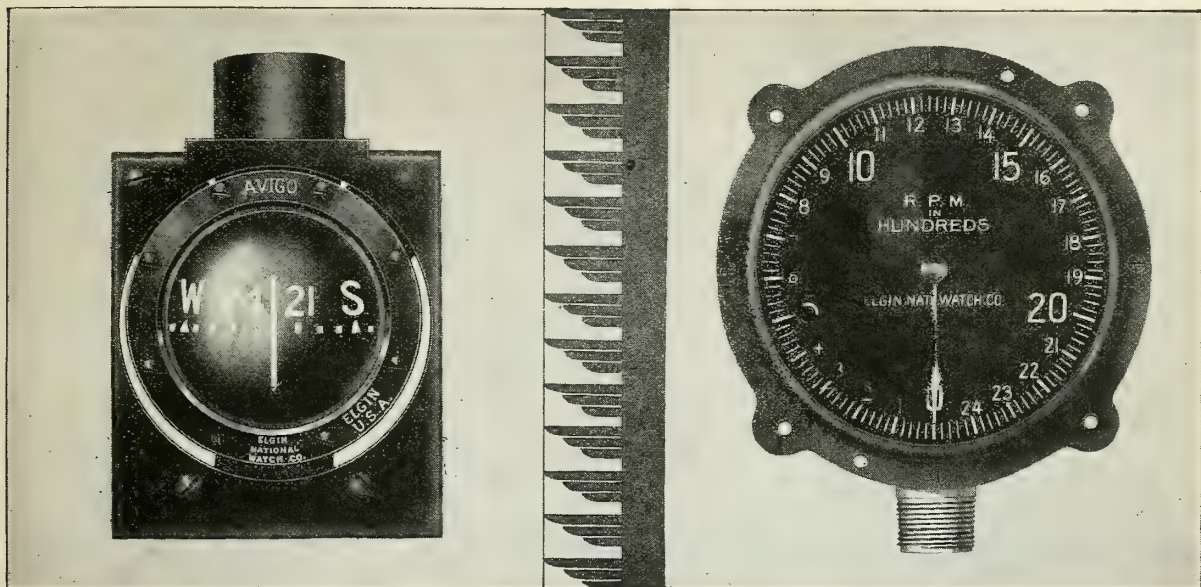
*Abstract of a paper presented by Lieut. Commander Clinton H. Havill, U. S. N., at the Aeronautic meeting, Society of Automotive Engineers, Chicago, December, 1928.*

**N**EARLY all the aircraft propellers used by both the Army and the Navy are of the detachable-blade type. The Navy has found it necessary to make its own designs and to furnish the propeller manufacturers with finished detail drawings. In his paper Lieut. Com. Havill lists the sources from which data can be obtained and shows a chart from which can be found a diameter and setting of a pair of detachable blades that will give reasonably good performance for nearly any horsepower, number of revolutions per minute, and airspeed commonly used on direct-drive propellers at present.

Discrepancies between model tests and wind tunnel tests are cited, after which the author considers the subject theoretically. Substitute propellers are next considered, and also the strength of propellers. The author gives empirical formulas for maximum fiber-stress and explanations of them, describes the whirl-test for strength, discusses the necessity for the use of gearing, and enumerates the considerations that apply to variable-pitch propellers.



The racy lines of the Oriole sport plane, which has a speed of 103 m.p.h.



# PARTNERS

## IN THE CAUSE OF GOOD FLYING



*The ELGIN Chronometric Tachometer*

*The ELGIN Avigo Compass*



Both are built by the makers of Elgin  
Watches, manufacturers of precision instru-  
ments for over 60 years.

ELGIN NATIONAL WATCH COMPANY...AIRCRAFT INSTRUMENT DIVISION, ELGIN, ILL.

Say you saw it in AERO DIGEST



# SIX-PLACE RYAN BROUGHAM

At the Detroit All-American Aircraft Show, the Mahoney-Ryan Aircraft Corporation will show the new Ryan, six-place, dual control Brougham, designated as the B-3 Model with the new Wright Whirlwind J-6 300-horsepower engine. The ship has been tested by numerous pilots who have flown it in all sorts of weather.

The new Ryan Brougham has a new control system, with nothing above the floor but the stick and rudder pedals. All cables and torque rods are completely concealed.

The stick is in the center and may be taken by either person in the front seats, or central control may be had.

Comfort of the pilot is enhanced by the arrangement of the rudder and brake pedals. The rudder pedals are designed so as to afford a comfortable rest for the ball of the foot. The braking pedals, not touched in flight, are operated by a slight pressure of the heel. Bendix brakes are standard equipment.

The nine-cylinder J-6 engine is fitted with Eclipse hand-inertia starter equipment. A booster magneto automatically supplies a hot spark, insuring quick starting no matter what the weather. New standard steel adjustable-pitch propeller is regular equipment.

The stabilizer is adjusted by the action of an elevating lever on the stern post. It is operated by a lever at the left, working on a quadrant with fine toothed adjustments. Cables run direct to the elevating lever. Control cables operate through Micarta pulleys on turns and Bakelite guides protect them against rubbing. The stabilizer adjustment is sufficiently fine to permit an exact balance for all conditions of load.

The wing is built on I-section spruce spars. Ribs are of spruce, gusseted with mahogany plywood. They will sustain a distributed load of 575 pounds. A better airfoil is given the leading edge by a covering of plywood. The entire structure is varnished before covering. Tie rods, locked in place to prevent turning, are used instead of wires.

The fuselage is largely constructed of chrome molybdenum seamless tubing. Ac-

cording to the producer, it will withstand a pressure of 180,000 pounds to the square inch. Lionoil is pumped through the interior of each section under a pressure of 80 pounds to the square inch, effectually preventing corrosion. The oil is drained out and the inlets at the base of each weld through which it was pumped are then hermetically sealed.

Chrome molybdenum axles are also standard in the new ship. Shock absorbing struts are of the aerol air and oil plunger type.

Gasoline for 6½ hours cruising is carried in two wing tanks, one on each side of the center section. Each tank holds 50 gallons of gas. The left wing tank contains a ten-gallon reserve section, opened by a valve under the pilot's seat. One-half inch annealed copper tubing is used in the outlets to the reserve and wing tanks.

Fuel is strained through a gascolator, removing all water before it reaches the carburetor. Crystallized and broken gas lines are prevented in the new Ryan through the use of "olive" insert connections. They are clamped in place at every support, protecting the tube against vibration.

Full width automobile type upholstered seats, finished in Lindbergh Blue plush, beautify the interior of the new Brougham. Similar upholstery covers the walls and roof of the cabin. The color scheme is carried out by a strip of broadcloth to match, running beneath the window-sills. The interior window trim is of polished mahogany. Instrument board is finished in crystalline blue.

The baggage compartment is designed in the new Ryan so that the loading is placed further forward than in previous models, contributing to the balance of the ship. It is loaded from the outside and may be reached from the inside through a hinged shelf at the rear of the cabin.

Windows are fitted with Triplex non-shatterable glass. The characteristic segment shaped pilots windows of the Ryan are retained and may be lowered readily for clear side vision in rainy weather. The side win-

dows are raised and lowered with automobile type window cranks. Windows are recessed, adding to the attractiveness of the cabin.

Interior appointments include a heater and a new type of muffler which enables passengers to converse with ease. The customary cigarette cases and other conveniences are provided in the cabin, which is finished as luxuriously as the finest modern automobile.

The wide metal step built integral with the framework of the fuselage is a convenient means of stepping into and out of the cabin.

This ship is easily converted for water flying by replacing the landing gear with twin floats. Edo metal floats have been used successfully on the seaplane type of the Models B1 and B2.

## SPECIFICATIONS

### Dimensions

Span .....	42 feet 4 inches
Length .....	28 feet 4 inches
Height .....	9 feet 10 inches
Chord .....	7 feet

### Areas

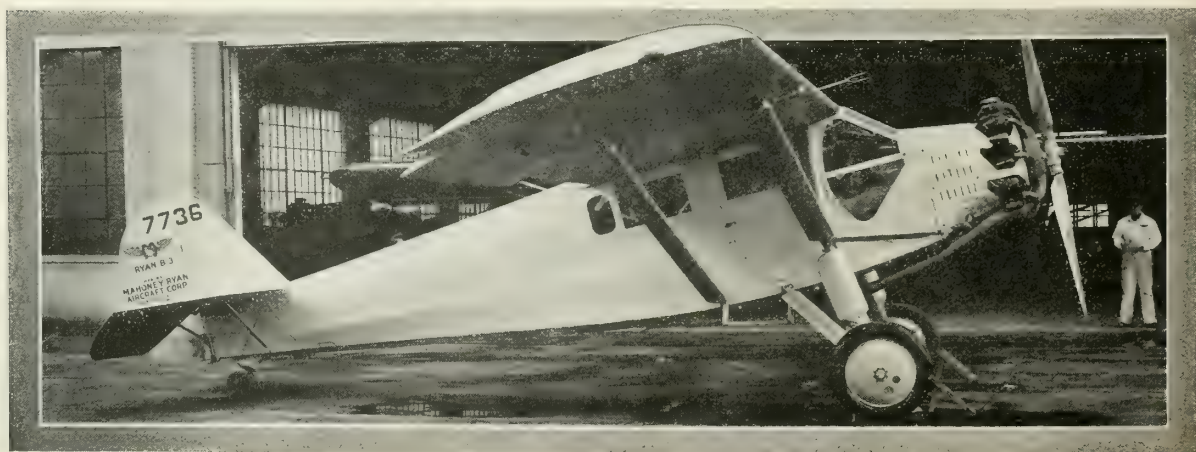
Wing area .....	280 square feet
Aileron area .....	24.4 square feet
Stabilizer area .....	26 square feet
Elevator area .....	16.3 square feet
Rudder area .....	9.7 square feet
Fin area .....	6.2 square feet

### Weights and Capacities

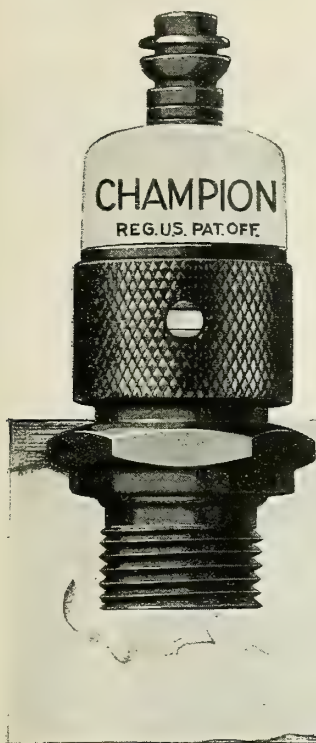
Weight empty .....	2200 pounds
Useful load .....	1800 pounds
Gasoline capacity .....	100 gallons
Oil capacity .....	8 gallons
Gross weight loaded .....	4000 pounds
Pay load .....	1000 pounds

### Performances

High speed .....	140 miles per hour
Cruising speed .....	120 miles per hour
Landing speed .....	50 miles per hour
Service ceiling .....	18,000 feet
Absolute ceiling .....	22,000 feet
Rate of climb .....	1,000 feet per minute
Cruising Radius (6½ hours) .....	750 miles



The Ryan B-3 six-place cabin Brougham with the new Wright Whirlwind J-6 engine.



# *A Positive Factor of safety and dependability*

**C**HAMPION began two years ago to develop a spark plug scientifically designed to deliver the absolute dependability and maximum safety so essential to aircraft engines.

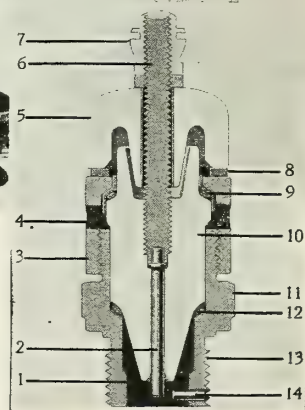
The result of this exhaustive research and rigorous tests has been a revolutionary new Champion Aviation Spark Plug which now provides an entirely new factor of safety and reliability.

New in principle and design Champion Aviation Spark Plugs incorporate the time-tested and exclusive superiorities of all Champions, together

with wonderful new factors of improved performance.

Their dual insulator of exclusive Champion sillimanite is so designed that it is practically impossible to break it in such a way as to interfere with engine operation. Their ability to withstand tremendous pressures and temperatures is combined with equal ability to withstand a maximum amount of oil.

A complete set of Champion Aviation Spark Plugs will bring to your plane not only finer performance but also safety and dependability to an unprecedented degree.



## *Champion Aero Line Exclusive Features*

- 1- . . . . . Semi-petticoat tip
- 2- . . . . . Special analysis electrode
- 3- . . . . . Bushing
- 4- . . . . . Air cooling space
- 5- . . . . . Secondary dome insulator
- 6- . . . . . Steel spindle
- 7- . . . . . Terminal
- 8- . . . . . Copper seal
- 9- . . . . . Upper copper gasket
- 10- . . . . . Primary insulator
- 11- . . . . . Shell
- 12- . . . . . Lower copper gasket
- 13- . . . . . Metric threads
- 14- . . . . . Ground electrode

## *Outstanding World's Records Made With Champions*

Altitude — 38,793 feet, December 21, 1927 — Major Renato Donati.

Speed — 318.69 miles per hour, March, 1928 — Major Mario De Bernardi.

Women's Altitude Record — 22,500 feet, December 8, 1928 — Louise McPhetridgePhaden

# Champion

## SPARK PLUGS *for aviation*

Toledo, Ohio

Windsor, Ontario



# ROGERS SEA HAWK FLYING BOAT

By JOHNSON WRIGHT

**A** NEW flying boat named Sea Hawk has been built and successfully test-flown by the Rogers Aeronautical Manufacturing Co., of New York. This new seaplane was designed and built in accordance with the Department of Commerce requirements, and as soon as an approved type certificate is received, it will be put into production.

The plane is designed to accommodate a pilot and three passengers, but five can be comfortably seated. It is a single bay biplane of conventional design, embodying a number of novel but proved features. When in production a retractable landing gear will be installed, placing the plane in the amphibian class.

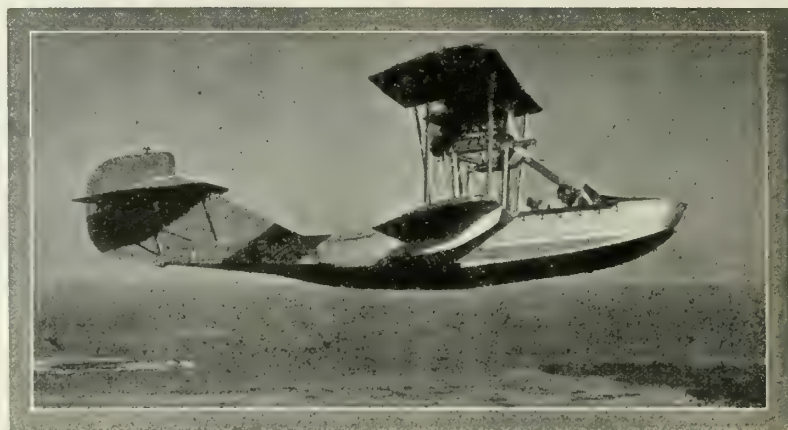
The design of the plane incorporates the practical ideas of Harry Rogers, president of the company.

The first plane was launched at Port Washington, L. I., in January and immediately flight tested by George Rommell. After five hours' testing, Rommell, accompanied by Russell Rogers, flew the ship to Miami, Florida, in three hops.

The plane is designed to take any engine up to 250 horsepower. For test purposes the water-cooled Curtiss C-6 engine developing 150 horsepower was installed. With an engine of more power, there will, of course, be an appreciable improvement in performance.

The hull is of composite wood and metal construction. The frame is of wood and the ribs are covered with Alclad.

The wings are of wood and fabric. The Clark 72 wing section is used. The con-



The 150 h.p. Rogers Sea Hawk flying boat in flight.

of the slipstream and above the spray while taxiing.

When equipped with a water-cooled engine, a radiator is placed on the hull aft of the propeller wash. This is the first time a radiator has been placed in this location on an American built plane. The first similar installation was that on the Savoia-Marchetti, holder of the world's distance record. More effective cooling is obtained by this installation which also permits efficient streamlining of the engine. Water piping to and from the radiator is carried in the rear engine bearer struts. An expansion tank is carried in the leading edge of the upper wing. Shutters on the radiator are controlled from the pilot's cockpit.

A gravity gas system is used. Separate lines with individual shut-off valves carry

mately 30 cubic feet. This space in flying boats is generally used for housing the gas tanks, but placing them in the upper wing made it available for storing baggage.

Flying lights are installed on the wing tips and the rudder. The plane is wired for landing lights which can easily be installed. A storage battery in the hull operates the lights and also the Bendix starter.

An anchor rope and anchor are placed in a small compartment in the bow.

The plane has remarkable stability in the air. With the engine shut off, it settles into a normal glide. The action of the controls is positive and the response immediate. Although the stalling speed is 42 miles per hour, the writer observed that in a number of landings with tanks full and two passengers that the air speed indicator showed a speed of 38 to 39 miles per hour at the moment of contact. It is economical in gas consumption, tests with full loads having shown a rate of only eight gallons per hour at cruising speed.

## Specifications

Span, upper wing	40 feet
Span, lower wing	30 feet
Wing area (including ailerons)	368 square feet
Chord	6 feet
Length	31 feet 6 inches
Height	11 feet 8 inches
Gasoline capacity	50 gallons
Range, cruising speed	6 hours
Dihedral, upper wing	1 degree
Dihedral, lower wing	2 degrees
Stagger	15 inches

## Weights

Weight empty	2,205 pounds
Useful load	1,045 pounds
Total weight loaded	3,250 pounds

## Performance

High speed (full load)	90 miles per hour
Cruising speed	72 miles per hour
Stalling speed	42 miles per hour
Time of take-off (light)	14 seconds
Time of take-off (loaded)	25 seconds
Rate of climb, (first minute)	400 feet



The Sea Hawk produced by Rogers Aeronautical Corporation.

struction of the wings is similar to that of the wing on the Curtiss-Robin. The center section of the upper wing houses two 25-gallon gas tanks. The ailerons are set in about eight inches from the wing tips. They are wide and have the Frise balance. The interplane struts are of hollow steel streamlined with wood.

The tail group is similar in design and size to that of the Curtiss Seagull, except that the horizontal surfaces have been raised 15 inches and the rudder has a steel frame that eliminates warping. The raising of the horizontal surfaces places them in the center

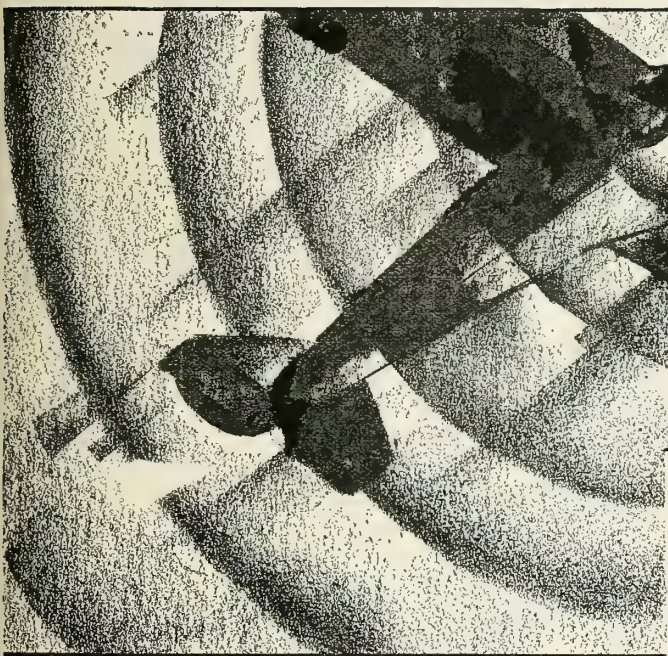
the gas from the two 25-gallon tanks in the upper wing down to the carburetor. An electric gauge that indicates separately the gas in each tank is placed on the dash.

In the forward cockpit, side by side control of the Dep type is provided. One of the controls can be disconnected instantly to permit the instructor to take the control of the plane away from the student. The dash contains the usual instruments including a compass, a bank and turn indicator, and an electric gas gauge.

Behind the passenger cockpit is a baggage compartment with a capacity of approxi-



# STABILITY



*The plane sketched is a Buhl Standard Airsedan, six-place, dual-control, powered with a Wright Whirlwind J-6; high speed, 145 m. p. h.; cruising speed, 115 m. p. h.*

THE ability to "ride out" the infancy of an industry, to contribute to its progress—that is the stability which makes for future as well as present leadership.

That is why the Buhl Aircraft Company is in the front rank today and is constantly forging further ahead. Its background of allied Buhl interests, for 95 years an integral part of American industry; its complete line of Air-

sedans, in which airline operators, private owners and corporations alike find a plane to meet their every requirement; its dealer plan in which factory co-operation and profit are assured, all combine to build an institution of unquestioned stability.

We shall be pleased to mail an illustrated catalog or to forward details of our dealer plan.

*Buhl Airsedans will be exhibited at the All-American Aircraft Show, Detroit, Michigan, April 6 to 14, 1929*

#### DISTRIBUTORS

CALIFORNIA  
Porter-Hughes Aircraft  
Clover Field, Santa Monica

IN THE NORTHWEST  
Mamer Flying Service  
Spokane, Washington

OHIO  
Johnson Flying Service  
Dayton, Ohio

MASSACHUSETTS  
Wetmore-Savage Aircraft  
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EASTERN CANADA  
National Air Transportation, Ltd.  
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Alberta, Canada.  
Cherry Red Air Lines, Ltd.,  
Prince Albert, Sask.

# BUHL Aircraft Company

MARYSVILLE, MICHIGAN



# CONTINENTAL RADIAL ENGINE

**T**HE first engine of the aircraft series of Continental Motors Corporation is a 7-cylinder, radial type developing 150 horsepower at 1,850 revolutions per minute. A 5 to 1 compression ratio is used. The bore and stroke are both  $4\frac{5}{8}$  inches, giving a total piston displacement of 544 cubic inches. Its weight without starter is about 375 pounds.

Production on the first of Continental's aircraft series will commence some time in April. Additional facilities for manufacturing and testing the aircraft product are nearly ready.

Cylinders are built up with heat-treated aluminum alloy heads screwed and shrunk to forged steel barrels. Bores are ground to very close limits. Valve rocker boxes are cast integral with the cylinder head, and cast aluminum covers are secured with studs and nuts. Aluminum bronze valve seats are shrunk in place. Inserts of the same material are used for spark plug openings. Each cylinder is secured to the crankcase with ten studs and nuts.

The crankcase is constructed of heat-treated aluminum alloy and split on the center line of the cylinders. The front half carries the ball thrust bearing and the forward main roller bearing. The rear half carries the rear main roller bearing and contains the cast-in induction manifold. Cam follower guides are in the rear half, and the mounting bosses are also located on this part of the crankcase. Ample space is provided between the thrust bearing and

front roller bearing to insure maximum crankshaft rigidity. The main roller bearings are mounted in bronze liners and the thrust bearing in a steel retainer. A breather is located on the front half of the crankcase.

Pistons are heat-treated, permanent-mould, aluminum alloy castings. They are the full skirt plain cylindrical type. Skirts are unusually long in order to distribute wear over a larger surface. The heads are thick to minimize heating and scuffing. Reliefs are provided at the vicinity of the piston bosses to avoid the possibility of seizing. Piston pins are secured in bosses by wire snap rings. Four piston rings are used, three above and one below the piston pin.

Connecting rod assembly is constructed of heat-treated chrome vanadium steel one-piece master and articulated rods all of which are completely machined. The rods are designed with "H" sections. All link pin and piston pin bushings are of bronze and the master rod crankpin bearing is a steel back, babbitt-lined bushing. Case hardened link pins are secured in place by locking plates.

The crankshaft is constructed of two heat-treated chrome nickel forgings, completely machined with counter weights riveted on. The shaft is parted at the rear cheek where the crankpin is secured by a clamping bolt. The crankshaft is drilled through for lightness and plugged at the rear section and crankpin to form a passage for oil to crankpin and linkpin bearings. The timing and

starter gears are driven by a spline at the center of the rear portion of the shaft. Either S.A.E. No. 2 taper, or S.A.E. No. 20 spline, propeller mountings can be supplied.

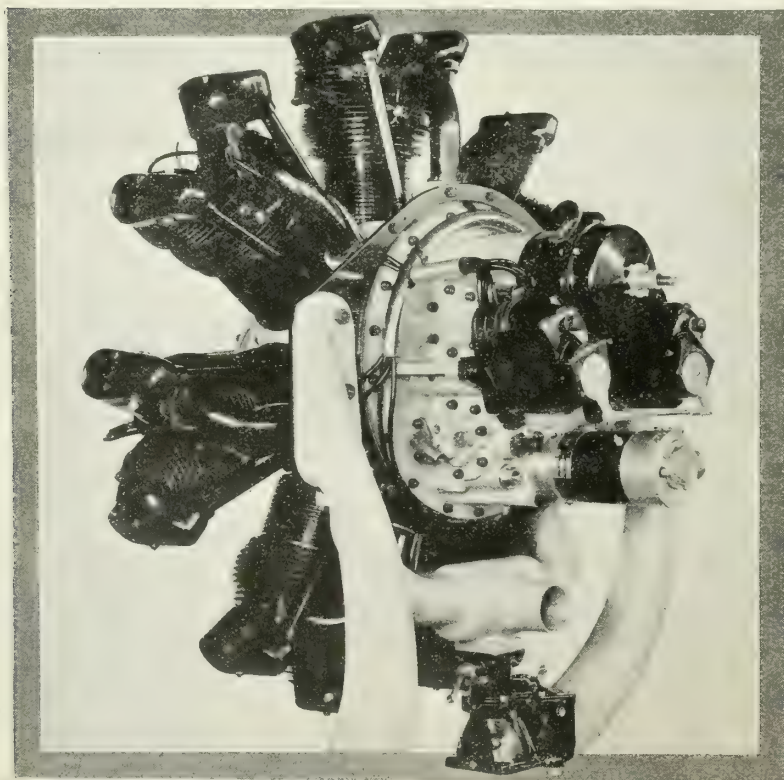
Both intake and exhaust valves are made of C.N.S. alloy and are of the hollow-stem, tulip type. Two straight helical springs are used on each valve. Rocker arms are of forged chrome vanadium steel and heat-treated. The arms are mounted on ball bearings and valve adjustment is on the front end of the rocker. Push rods are of duralumin tubes with hardened steel ball ends. They operate in light steel protecting tubes. Cam followers are oil hardened chrome vanadium steel with case hardened rollers, pins, and push rod cups. Cam follower guides are made of a special aluminum-alloy bearing metal. The cam ring and gear are case hardened chrome vanadium steel riveted to a forged duralumin hub. The cam ring assembly is mounted on a bronze bearing and driven from the crankshaft timing gear by an intermediate gear mounted on a stud shaft secured in the gearcase.

The crankshaft starter gear is mounted on splines in the center of the rear half of the crankshaft. The starter shaft gear is of equal size and meshes with the crankshaft starter gear above the crankshaft. The two magneto shafts, one on each side of the crankshaft, have integral gears which mesh directly with the crankshaft starter gear. The cam, generator and pump shafts are driven by the crankshaft timing gear which is mounted on the crankshaft and driven by the starter gear through a finely serrated clutch which is held in engagement by a screw at the end of the crankshaft. The generator shaft lies below the crankshaft and is driven by the cam intermediate gear. The pump shaft is located transversely at the rear of the gear and driven by helical gears from the generator shaft. Pump shaft drives the oil pressure and scavenging pumps and tachometer drive at the one end and the fuel pump at the other.

All accessory drive gears are forged integral with their shafts and plain split type bearings are used except in the case of the oil pump shaft which is mounted on ball bearings. Full pressure lubrication is supplied. All accessory gears, except the helical pump gears, are straight spur stub tooth gears constructed from oil hardened chrome vanadium steel.

Simple and accurate timing adjustments are made possible by the use of the serrated clutch between crankshaft starter gear and crankshaft timing gear. Loosening the screw at the rear end of the crankshaft automatically disengages the clutch and permits adjustment of the timing gears with reference to the crankshaft.

Scintilla magnetos using the standard S.A.E. three-bolt flange mountings are provided. Optional distributor units for battery ignition can be substituted for the magnetos. Two B.G. spark plugs are provided for each cylinder.



Accessory end of the 150 h.p. Continental engine.

# 25 CURTISS FLYING FIELDS IN 1929 " > < " > < " > < "



This means that there will be 25 fully equipped *service stations* giving expert mechanical service on every plane, engine or part made or sold under the Curtiss name.

Its also means that there will be 25 *flying schools* where prospective pilots learn to fly under experienced instructors, using the most modern equipment available.

Thus is established—under the auspices of the finest and most highly organized flying service in the world—a nation-wide chain of aviation service stations, schools and centers where the public can follow the modern urge to fly.



"—World's Oldest  
Flying Organization"

## CURTISS FLYING SERVICE, Inc.

NEW YORK OFFICE—GARDEN CITY—LONG ISLAND

*Sole Sales Agents for*

CURTISS AEROPLANE AND MOTOR CO., INCORPORATED  
SIKORSKY AVIATION CORPORATION IRELAND AIRCRAFT, INCORPORATED  
CURTISS-ROBERTSON AIRPLANE MFG. CO.





## No Modern Pilot's Training Is Complete Without Instruction in a Closed Cabin Plane

The present wide-spread use of the closed cabin plane and the differences in flying this type and the open cockpit model, make it necessary that the modern pilot be able to fly both types.

The Curtiss OX-5 Robin is the only OX-5 powered cabin plane combining great ease of control, extreme maneuverability, clear vision, slow landing speed, and economical fuel consumption. It is this *exclusive performance* that makes the Robin the ideal closed cabin training plane.

Instruction in the Robin is included in the flying training given at Curtiss Flying Schools and others whose methods are modern and whose equipment is up-to-date.

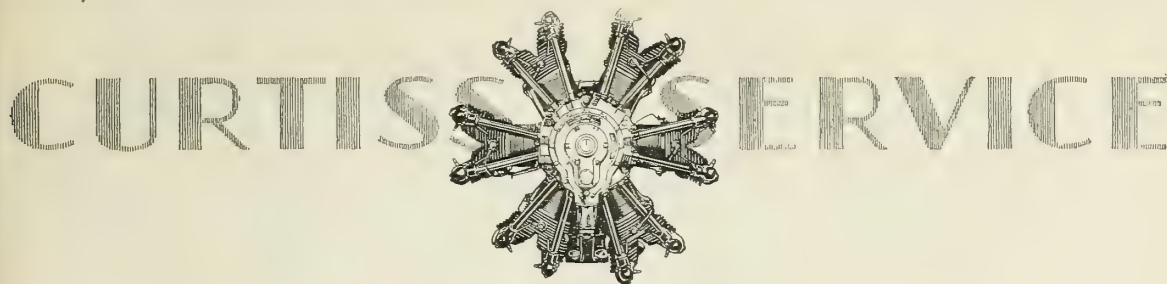
*Write for information and a copy of the booklet on our  
Flying School Course*

## CURTISS FLYING SERVICE, INC.

*New York Office*  
GARDEN CITY, LONG ISLAND  
"—World's Oldest Flying Organization"



*Sole Sales Agents for*  
CURTISS AEROPLANE AND MOTOR CO., INC.  
CURTISS-ROBERTSON AIRPLANE MFG. CO.  
SIKORSKY AVIATION CORPORATION  
IRELAND AIRCRAFT, INC.



## There Was Only One Thing the Engineers Couldn't Put Into This Fine Engine

Skillful and experienced engineers designed and built the Curtiss Challenger engine—taking all the time they needed—and using the facilities of the oldest manufacturer of engines in the country—Curtiss.

Exacting laboratory and gruelling flight tests have proved the engineers right—it is a fine engine, worthy of Curtiss traditions.

Still there is one thing the engineers could not build into it, but that Curtiss Flying Service has added—the great servicing advantages of 25 Curtiss Flying Fields. (*Ten such*

*fields are now in active operation.*)

Located at strategic points throughout the country, *each Field will have a fully equipped service station to render instantaneous service on the Challenger engine—in 1929.*

Thus Cessna, Travel Air, Stinson, Command-Aire, Alexander, and other representative manufacturers are installing Challenger engines in their planes—for they know that it is mechanically a fine engine, and their customers know what it means to have a nation-wide chain of 25 Curtiss Service Stations *always* ready to give them service.

(FURTHER INFORMATION GLADLY FURNISHED ON REQUEST)



## CURTISS FLYING SERVICE, Inc.

NEW YORK OFFICE—GARDEN CITY—LONG ISLAND

*Sole Sales Agents for*

CURTISS AEROPLANE AND MOTOR CO., INCORPORATED

SIKORSKY AVIATION CORPORATION

IRELAND AIRCRAFT, INCORPORATED

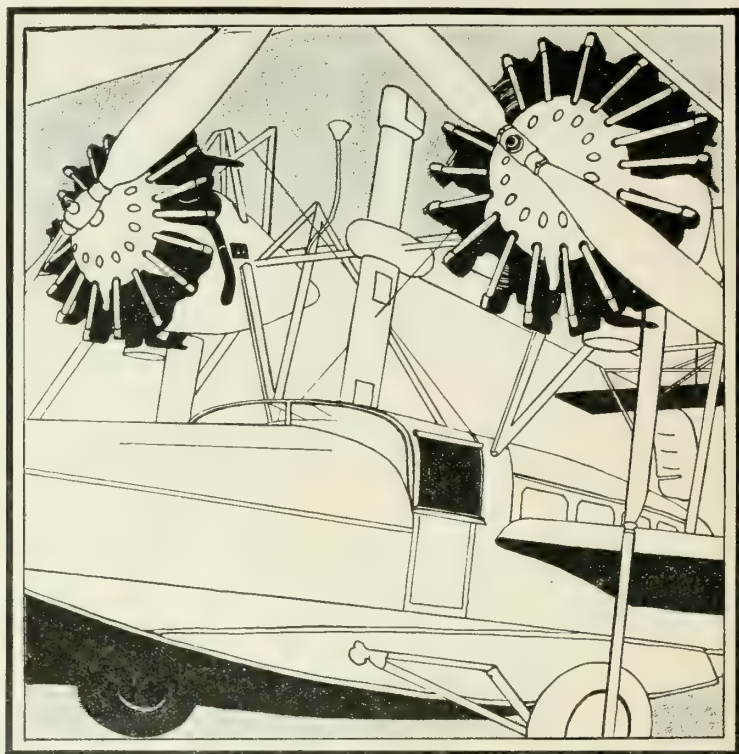
CURTISS-ROBERTSON AIRPLANE MFG. CO.





## THREE GREAT SIKORSKYS

*Each With Two  
Powerful Engines*



# Fly Over 1200 Miles of Caribbean Sea Daily With Unfailing Performance



*"—World's Oldest  
Flying Organization"*

As the twin-motored Sikorsky Amphibion *can fly and climb on one engine*, the safety and flying comfort of passengers and pilots is *insured*. Thus Pan-American Airways, operating a direct passenger line between Miami and Havana, conveys its precious Caribbean cargo 1200 miles every day with a confidence based on the knowledge that the liabilities of a forced landing is reduced to a minimum.

## CURTISS FLYING SERVICE, Inc.

NEW YORK OFFICE—GARDEN CITY—LONG ISLAND

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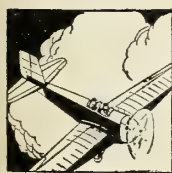
CURTISS AIRPLANE AND MOTOR CO., INCORPORATED  
SIKORSKY AVIATION CORPORATION IRELAND AIRCRAFT, INCORPORATED  
CURTISS-ROBERTSON AIRPLANE MFG. CO.

# Are YOU A PILOT for PAY or PLAY..?

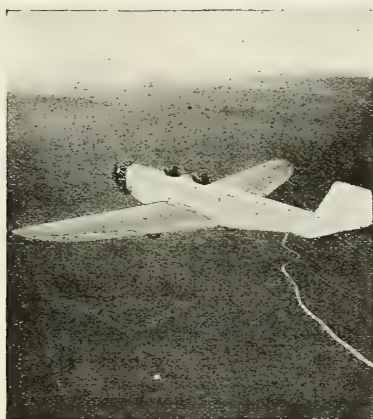
## IS aviation your vocation, . . . or . . . avocation . . . . . ?

Unless you intend to make aviation your business, your source of income, your future vocation—there is little reason for you to read further. For, this advertisement is addressed primarily to men who have decided to make their livelihood "in the air"—men who believe in the present and immediate future of aviation and are willing to mix brains and perspiration in the accomplishment of their purpose.

★ As one vitally interested in the advancement of commercial aviation, your first consideration should be the determination of where and how the profits in aviation will be made. How you can best employ your time and talents to lucrative means—how you can knowingly and reasonably take the first step forward in a logical manner.



★ To make a profit there must be a sale. And to make a sale there must be a market. Markets are people. Consequently, the aviation market means people who will participate in aviation. But, the present aviation market, insofar as the sales of private planes are concerned, is circumscribed by the number of people who can and



are by license permitted to fly. The first step, therefore, in expanding the aviation market is to teach more people to fly. All of which obviously means more and better flying schools. To this end, nothing can contribute as much to the profitable success of a school as the type of training plane used—an airplane which by design and construction will stand up under the rigorous punishment incidental to flying instruction . . . *economically and safely.*

★ Such a plane is the Aeromarine Klemm—AKL25 monoplane—which, for years has been considered the standard training plane throughout Europe. Powered with the well-known Salmson forty horsepower engine, an AKL25 will "fly" both instructor and student on less than four gallons of fuel an hour. A remarkable performance, is it not? In fact, if we were to put the complete performance figures of an AKL25 in print, we would invite doubt and skepticism on the part of the reader. But once you witness a demonstration, your amazement readily changes into the realization that the AKL25 is truly more than has been claimed.

## HOW you can make aviation Pay . . . Now . . . !

The present demand for flying instruction exceeds by far the existing aviation school facilities. For the experienced pilot, who has a knowledge of modern merchandising methods and a corresponding degree of salesmanship, the present status of the industry offers an unparalleled opportunity for him to go into business for himself. All that is required is the initial capital, a sense of service, and an aptitude for organization.



★ To promote the development and expansion of both existing and contemplated flying schools, we are prepared to assist you, not merely in supplying the flying equipment—AKL25 planes—but, in the selection of the right location for your school—in the organization of your personnel and, in the planning of your advertising and sales promotion material.

★ Thousands upon thousands of people are seeking the right school for flying instruction. If you have the same perspective of the aviation situation as we have, and you are sincerely interested in starting or expanding your own school, we will gladly co-operate with you in every way possible. Write us for details.



UNITED STATES DEPARTMENT OF COMMERCE APPROVED TYPE CERTIFICATE No. 121



# AEROMARINE KLEMM CORPORATION

Paramount Building · 44th Street and Broadway · New York City



# THE AIR SERVICES

## NEW ARMY PILOT REGULATIONS

TO be designated a military airplane pilot, all officers of the Army Air Corps must hereafter be graduates of the advanced flying course with 200 hours of plane piloting, of which 75 hours are solo and 100 hours are in service type planes, according to a new policy established by the Chief of the Air Corps. The new regulation is designed to improve the efficiency of the Army flying body.

With the same record, other members of the Air Corps are eligible to the rating of military airplane pilot with the recommendation of proper officers. They are: those with one year's piloting experience with a tactical organization, those having three years with the National Guard Air Corps, and those having five years in the organized reserve with three active duty periods. All prospective military pilots must qualify on theoretical subjects.

## SOCIETY OF AERONAUTS

OFFICERS stationed at Langley Field having lighter-than-air ratings have organized the Langley Field chapter of the Society of Military and Naval Aeronauts. The mother chapter of this organization was formed some time ago by lighter-than-air officers of Brooks and Kelly Fields.

The Constitution of the Society sets forth the purposes of the organization as solely patriotic, educational, scientific and fraternal, with the three-fold objective of fostering the development of aeronautics (especially airship and balloon operation), encouraging and aiding in the development of this important arm of national defense, and of creating a bond of fellowship between personnel who are, or have been, engaged in the development of lighter-than-air craft. The following officers of the local chapter were selected: Captain Stone, president; Captain Flood, vice president; and Lieutenant Buie, secretary and treasurer.

## ARMY PLANE DELIVERIES FOR 1928

AIRPLANES delivered to the Army Air Corps during 1928 totaled 542, according to figures compiled by the Corps. During the year, 393 planes were contracted for at a cost of \$5,174,245. Of these 155 were observation planes, 47 bombardment, 8 cargo, 120 training, and 63 pursuit. The number delivered on 1928 contracts during the same year was 92.

For the fiscal year 1929 a sum of \$13,342,445 was appropriated for the purchase of planes for the Regular Army, and \$194,097 for the organized reserves.

## DINNER TO RICHARDSON AND GUNNELL

OFFICERS of the Aeronautics Bureau, Navy Department, and of other air activities in Washington, gave a farewell dinner in honor of Capt. H. C. Richardson and Capt. J. H. Gunnell. Commander J. H. Towers officiated as toastmaster.

## NAVY ALASKAN SURVEY TO BE COMPLETED

THREE Loening amphibians of the Navy aircraft squadrons will arrive in southeastern Alaska about May 25 to complete the aerial survey of that part of Alaska begun in 1926. Aerial photographs will be taken at 10,000 feet with the T-2-4 lens camera. The area to be surveyed amounts to over 10,000 square miles. In addition to valuable data to be obtained for maps, the oblique photographs showing timber areas and waterfalls is of great importance to the Bureaus of Forestry and Fisheries, and is valuable in the consideration of the further development of water-power.

R. H. Sargent of the Department of the Interior will accompany the expedition, and Lieut. Commander A. H. Radford, U.S.N., will be officer in charge.

## D. F. C. TO CREW OF THE "QUESTION MARK"

MEMBERS of the crew of the *Question Mark* were recently awarded the Distinguished Flying Cross for their endurance flight in January by the Secretary of War. Capt. Ira C. Eaker, who already has the D. F. C., will receive the first oak leaf cluster to be worn on the cross. Maj. Carl Spatz, 1st Lieut. Harry A. Halverson, 2nd Lieut. Elwood R. Quesada, and Staff Sgt. Roy W. Hooe received the decoration.

## FIELDS NAMED FOR MARINE FLIERS

FIVE landing fields in Nicaragua have been named in memory of United States Marine fliers who lost their lives in service during the past eighteen months. These fields are: Archibald Field at Managua, Byrd Field at Puerto Cabezas, Thomas Field at Ocotol, Dowdell Field at Apali, and Frankforter Field at Esteli.

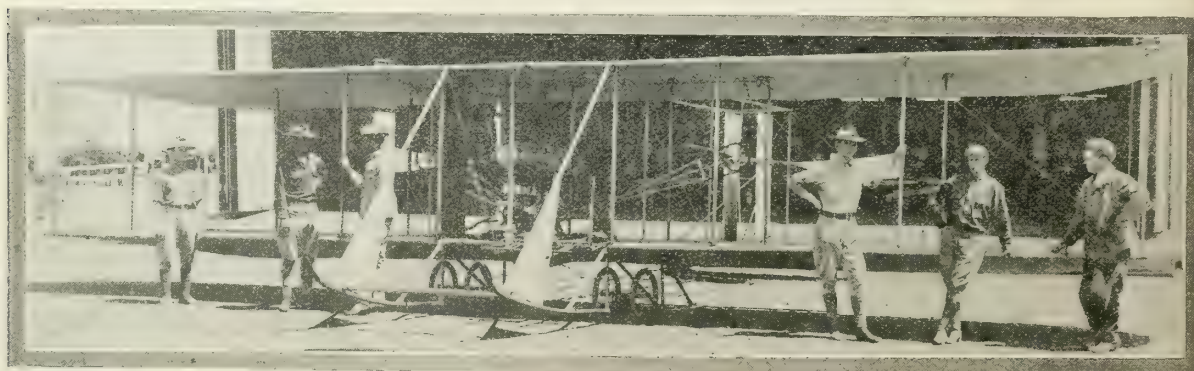
## RADIO TEST SECTION AT ANACOSTIA

AN aircraft radio flight test section has been established under the Flight Test Section of Naval Air Station, Anacostia, D. C., in order to speed up the work of radio flight tests and acceptance flight tests.

## SUMMER AVIATION TRAINING FOR MIDSHIPMEN

TWELVE weeks in practical aviation work will be given to midshipmen of the second class of the Naval Academy during the summer as a result of an order recently signed by the Secretary of the Navy. A ground course with five hours of observation flying as gunner, radioman, navigator, and mechanic, will comprise the study.

(Continued on next page)



Entire Army Air Service in 1910, with first Army airplane. Left to right: Corp. V. L. Burge (now Captain), Private Chapman, Sergt. Herbert Marcus (retired), Sergt. S. J. Idzerck (now captain), Lieut. B. D. Foulois (now Brig. Gen.), and O. S. Simmons.



## THE VOUGHT HIGH PERFORMANCE AMPHIBIAN

**I**N the "Corsair" Amphibian, the Vought Organization has produced a plane which represents an entirely new conception of the requirements for high-performance amphibians. This Vought amphibian is inherently simple, positive in action, and comparatively light in weight, resulting in an all-around performance greatly in excess of that shown by former types designed for the same purposes. This gear, designed primarily for military use on aircraft carriers, can be used on single-seater fighters, as well as the Vought two place observation-fighting planes. And planes using this gear are quickly convertible back to either straight land-planes or seaplanes, which, in emergencies, makes immediately available to our Air Forces, planes of the highest possible performance, and in the meantime provides planes incorporating the maximum safety feature of being able to land either on land or on water.

The Vought "Corsair" equipped with the new Vought Amphibian Gear

By use of this new gear, this famous plane has extended still further its already wide range of utility.



## CHANCE VOUGHT CORPORATION

DIVISION OF THE UNITED AIRCRAFT & TRANSPORT CORP.



LONG ISLAND CITY

NEW YORK



(Continued from preceding page)

## RESERVE FIELD AT CAMP KNOX

UPON the recommendation of Maj. Gen. Dennis Nolan, commanding the Fifth Corps Area, the Secretary of War has authorized the expenditure of \$4,000 for the preparation of a new landing field at Camp Knox, Kentucky, for the use of the National Guard, Reserve Officers' Training Corps and Organized Reserve units in connection with their summer training camps.

## TEXAS TO WASHINGTON

LIEUT. JOHN E. UPSTON of the Army Air Corps information section recently made a 1,400-mile flight from Fort Crockett, Galveston, Texas, to Washington, D. C., in 13 hours and 45 minutes in a Curtiss Falcon observation plane. Two stops were made for fuel. Hans Adamson, secretary to F. Trubee Davidson, Assistant to the Secretary of War for aviation, accompanied Lieut. Upston on the trip.

## PACIFIC COAST AIR-CORPS BASE

PLANS for the establishment of an Army air base on the Pacific Coast are being considered by officials of the Army Air Corps. The proposed base would require 350 to 550 acres, with runways 2,500 feet long, and operation facilities.



Miss Mary Fechet, daughter of Gen. Jas. E. Fechet.

## FORD PLANES FOR NAVY

THE Navy Department has made a contract with the Stout Metal Airplane Company, Detroit, Mich., for two model J2R-1 (Ford transport) airplanes and drawings.

These airplanes are the latest type Ford transport planes powered with three 300 horsepower Wright Whirlwind J-6 air-cooled engines. The planes will have a seating capacity for eight passengers, pilot and mechanic, and since they have more horsepower than the present type, much better performance is expected.

## Order of the Undistinguished Flying Cross

By VERNE HINKLEY

NOT to be outdone by other Army units, Wheeler Field, Hawaii, has organized a special order of the "Undistinguished Flying Cross." An informal order, issued by Lieut. T. J. Koenig, group operations officer, reads in part as follows:

"Effective immediately the Undistinguished Flying Cross will be awarded temporarily to all pilots of this group for the infraction of any of the common laws of flying.

"Regulations governing the award of this decoration, suitably engraved, are outlined as follows:

"Awarded by the group operations officer immediately after the apprehension of any pilot having pulled a 'boner.' The decoration will be worn the remainder of the day on which same is awarded. Pilots will accept this award at any time they are cited for the same.

"Low flying over restricted areas, jazzing beach hotels or any stunt considered dangerously contaminating to the gentlemen pilots of this group, are equally considered for this award."

"It is necessary to make such an award as the above in order to maintain the esprit de corps of this organization."

The medal itself is provided with a huge safety pin for attaching to the breast of the officer's tunic. From it a red and white ribbon hangs. Across its face are the words "I Am A Donkey."

## ESLINE BUILDS OWN MODERN HANGAR PLANT

Increased Demand For Product Necessitated Larger Plant at Oconomowoc

OCONOMOWOC, Wis., March 22. It was announced yesterday by Byron F. Esline, president of the Esline Company, pioneer builder of sectional steel industrial buildings and airplane hangars, that the Company was erecting a new modern hangar plant at Oconomowoc, Wisconsin.

"This new plant," said Mr. Esline, "is Esline steel construction throughout and is exactly the same substantial type of construction that is put into all Esline Industrial Buildings."

Esline Hangars have become very popular throughout the country. This popularity is particularly due to the fact that the new plant is fire and weather-proof; it offers a larger area free from columns and posts, thus facilitating the handling of ships, can be conveniently and economically enlarged and when moved is 100% satisfactory.

The Esline Company manufactures hangars to a common size and number of ships and industrial buildings for every purpose. The new plant is 100 feet wide by 200 feet long and is located on St. Paul Railroad, which offers excellent shipping facilities.

Use this Convenient Coupon!

## HERE IS GOOD NEWS!

The announcement that the Esline Company is erecting its own modern Hangar Plant—the same type of construction that goes into every Esline steel Hangar—is good news.

It means greatly enlarged manufacturing facilities to meet the ever-increasing demands for Esline Hangars.

The answer to Esline popularity with experienced aviators and airport owners is told in our new Hangar Literature. Write for it today.



Attractive Dealers Proposition Open for First Hangar in Your Territory.

## ESLINE COMPANY

OCONOMOWOC, WISCONSIN

DEPT. D. Please send complete information and literature for Hangar, size.....

NAME .....

ADDRESS .....

*When flying in the Southwest, use the products of Magnolia Petroleum Company; and on the Pacific Coast standardize on the products of General Petroleum Corporation. These are two important subsidiaries of Standard Oil Company of New York.*



Moth company officials making sure that everything is ship-shape prior to the test flight which proved so successful.

## *First Moth Plane is launched on test flight with Socony Aviation Gasoline*

THE Moth Airplane Corporation of Lowell, Mass., is another enthusiastic user of Socony Aviation Gasoline.

Their first Gipsy Moth assembled in America was fueled with Socony Aviation Gasoline on the occasion of its test flight to New York City.

You will find Socony Aviation Gasoline and Aircraft Oils readily available throughout New York and New England. Look for the familiar red, white and blue Socony sign.

# SOCONY

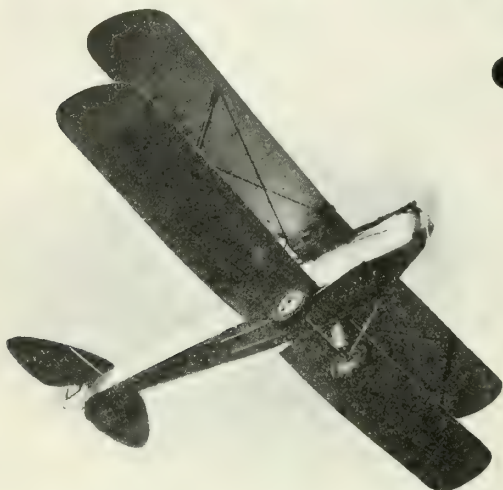
AVIATION GASOLINE  
AIRCRAFT OILS

STANDARD OIL COMPANY OF NEW YORK



# The D. H. Gipsy **MOTH**

## offers a valuable FRANCHISE to Qualified Dealers



**T**HE Gipsy Moth is already a world-wide success! Its performance, reliability, safety and economy have been proved during the past four years by over 5,000,000 miles of flying. Uses famous 100 horse-power D. H. Gipsy Engine, designed and built by de Havilland, in England, and entering American production by the Wright Aeronautical Corporation in April.

### **Moth Economy Makes Big Profits for Users**

The Moth can be operated for less than \$5.50 an hour, including all charges but depreciation and pilot's time. Folding wings permit storing three Moths in space occupied by single ordinary plane. This unusual economy makes the Moth exceptionally profitable for flying schools, private instructors, taxi service and other commercial work.

**For Training:** The Moth is the finest dual instruction plane yet produced. Used in military and civilian flying schools all over the world. Exceptional safety through use of famous slotted wings; unusual visibility; flies equally well from either cockpit; extra sturdy landing gear. Students can pass from Moth direct to practically any other plane without use of intermediate types.

**For Taxi Service:** The Moth carries one passenger with pilot

and 200 pounds of baggage at cruising speed of 85-90 miles per hour. Moth economy assures a profit on rates 50% lower than usual.

**For Personal Use:** The Moth is the ideal plane for the private owner. It is a most comfortable plane to fly. Off the ground in 80 yards; lands and stops in 120. Can be stored in a single-car heated garage. Uses any gasoline. Equally good for short hops and long cross-country flights.

### **A Tremendous Market Is Waiting**

A Moth sales franchise will be immediately profitable and will constantly increase in value. Territories are rapidly being closed, but many opportunities still exist for qualified Distributors and Dealers. Wire now for details—over 30% of 1929 Moth production is already sold! Or see our representative at Detroit Show who will demonstrate the Moth and explain the Moth franchise.

### **Moth Distributors**

*Metropolitan New York and Northern New Jersey:*  
Earl L. House, Graybar Building, New York

*Northeastern New York:* Albany Air Service, P.O. Box 1145, Albany, New York, and Albany Airport

*New England:* Skyways, Inc., Copley Plaza Hotel, Boston, Mass.

*Ohio and Michigan:* Thompson Aeronautical Corporation, 2196 Clarkwood Road, Cleveland, Ohio



LICENSEE: THE DE HAVILLAND  
AIRCRAFT CO., LTD.

## **MOTH AIRCRAFT CORPORATION, Lowell, Mass.**

# MOTH Distributors

**The following Distributors are qualified to appoint local Dealers in their territories. They will demonstrate the D. H. Gipsy Moth to prospective Owners and Dealers**

---

*Metropolitan New York and Northern New Jersey*

**EARL L. HOUSE**

Graybar Building, New York

---

*Northeastern New York*

**ALBANY AIR SERVICE**

P. O. Box 1145, Albany, New York, and Albany Airport

---

*New England*

**SKYWAYS, Inc.**

Copley Plaza Hotel, Boston, Mass., and Boston Airport

---

*Ohio and Michigan*

**THOMPSON AERONAUTICAL CORP.**

2196 Clarkwood Road, Cleveland, Ohio

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# WESTERN NEWS

## WOMEN'S DURATION RECORD AGAIN BROKEN

**MRS. LOUISE McPHETRIDGE** THADEN, holder of the airplane altitude record for women, set a new world's endurance flight record for women on March 16 and 17 by remaining aloft in her Travel Air biplane for 22 hours and 3 minutes over the Oakland, Cal., municipal airport.

Louise McPhetridge, as she is known in aviation, took off on March 16 with 196 gallons of fuel. Throughout the flight she clung closely to the twelve-mile course over the airport, varying her height from 800 to 1,600 feet. During the night she signaled watchers below with her landing lights. Occasionally one of the airport spotlights was flashed on the plane.

A check of the plane's gasoline tanks showed twelve gallons of fuel remaining after the flight.

Louise McPhetridge is the wife of H. Von Thaden, San Francisco airplane manufacturer.

## TOWING A GLIDER

**THE** first aerial tow job in the United States was accomplished February 28 when a Fokker Universal owned by O'Donnell Aircraft, Inc., and piloted by J. Lloyd O'Donnell, pulled a glider, piloted by Dale L. Drake, from Reedley to Long Beach, Cal., a distance of 200 miles. The trip was made after one trial flight test.

The glider was a parasol type, wire-braced, steel tube fuselage monoplane, and was attached to the plane by 500 feet of  $\frac{3}{8}$ -inch manila cable. O'Donnell took off in the Fokker carrying three passengers, two motion cameras, parachutes, and baggage. The glider left the ground at 15 miles per hour, and had more altitude than the plane by the time both were off.

The line of flight crossed the Sierra Nevada Mountains, where it was necessary to have altitude of 7,500 feet, and being heavily loaded, O'Donnell forced the Whirlwind engine of the plane to the limit of

its power to negotiate this pass. The air over the mountains was extremely rough. The crossing was made safely, however, and the planes were just leaving the edge of the mountains when the tow line broke after striking an unusually heavy bump. There were many fields available but the pilots headed for the Los Angeles Metropolitan Airport, about 20 miles distant. The glider, handicapped by the excess weight of the tow line which was still attached to it, landed about one mile north of the airport in a soft field. The glider was moved to the airport and the flight to Long Beach concluded the next morning.

## CALIFORNIA AIR NEWS

**AIRWAY** markings giving the name of the town and the direction of the nearest airport are to be placed on all structures belonging to the Southern Counties Gas Co. from Santa Barbara to Newport, according to the announcement of F. H. Bivens and A. F. Bridge, vice-presidents of the company. The Southern Counties Gas Co. is cooperating with the aeronautical committee of the California Development Association in this work.

**THE** Prudden-San Diego Airplane Company has been reorganized and re-financed and has installed certain new equipment. It is now constructing its first plane. This will be an eight-place, all metal ship, powered with a single 400 horsepower Wasp engine. This first plane is expected to be completed in April.

**THE** construction of Lindbergh Field, the new municipal airport at San Diego, is progressing rapidly. About 35 acres are completed and surfaced, and this area is now in use by the San Diego Air Service Corporation. This airport is being constructed by dredging certain areas in the bay and filling a portion of the tidelands. The entire outline of the field has been filled, and the filling and draining of the entire area is being done. The entire first unit of the air-

port, with an area of 142 acres, will be ready for use in the spring of 1930.

**THE** newly organized Pickwick Airways have secured a lease on Lindbergh Field and will very likely make this the base of their operations. Their transport service from Los Angeles to San Diego and Imperial Valley points will be inaugurated early in April.

**THE** Continental Air Transport Company, formerly known as the Harry Sperl Aircraft Company, will very shortly begin transport service between San Francisco, Los Angeles and San Diego.

**STANDARD** Airlines report that they have flown more than 160,000 miles. The new air-rail service between Los Angeles and St. Louis is being carried on with Fokker cabin planes powered by Pratt and Whitney Hornet engines. Pennzoil is used to lubricate these motors.

**M. G. SANDERSON**, former Clover Field pilot, has returned to the West Coast to take charge of aviation sales for the Warren Lubricant Co., Buffalo, N. Y. The company manufactures rocker arm grease which is especially adapted to all types of radial engines.

**THE** Kinner Airplane and Motor Corp. has received an order from the Alexander Industries of Colorado Springs for 300 motors, according to W. B. Kinner, president of the Kinner firm. This order, together with a similar one recently received from the American Eagle Aircraft Corp., has caused production to be raised to three motors per day in the Kinner plant.

**W. G. HERRON**, vice president of the Boeing Air Transport, Inc., has resigned from the Boeing concern to join Air Investors, Inc., in charge of the San Francisco interests of that concern, according to Harvey L. Williams, president of Air Investors, Inc. He will aid in the development of business for the concerns in which Air Investors, Inc., is interested.

Mr. Herron has been in charge of the traffic department of Boeing Air Transport since 1927.

**OFFICIALS** of the Axelson Machine Company including Jule C. Axelson, president; Delbert F. Axelson, vice president; and Clyde Ellwood, sales director, will attend the All-American Aircraft Show at Detroit. The firm will have a complete exhibit of engines at the show. The Axelson engine holds certificate number 16 of the U. S. Department of Commerce.

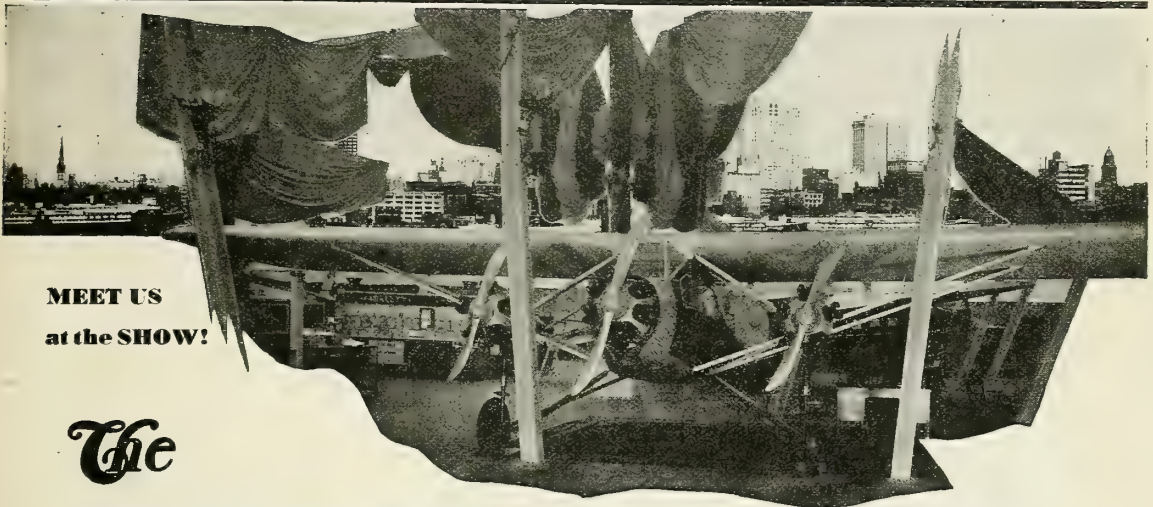
At the Detroit show the following planes will have Axelson engines: Command-Aire, Travel Air, Spartan, Swallow and American Eagle.



Dale L. Drake and J. Lloyd O'Donnell, who took part in the glider towing.

# ALL AMERICAN AIRCRAFT SHOW

## DETROIT APRIL 6<sup>th</sup>-13<sup>th</sup>



MEET US  
at the SHOW!

## The KREUTZER

### TRI-MOTOR AIR COACH

is the product of an organization which has come into being as the result of continued and constant adherence to the highest ideals of craftsmanship and service. Just as "Dependability" is the outstanding characteristic of the Kreutzer Tri-Motor Air Coach, "Thoroughness" is the outstanding characteristic of the organization behind it... thoroughness in engineering; in construction; in inspection and testing in sales, sales organization and service. The Kreutzer Tri-Motor Air Coach is the final expression of the highest ideals, the greatest skill and the latest knowledge in the field of aerial transportation.

There is Still Some Distributor and Dealer Territory Available. Write for Details.

### SPECIFICATIONS

#### PERFORMANCE

Cruising Speed	95 m. p. h.
High Speed	112 m. p. h.
Landing Speed	40 m. p. h.
Ceiling	16000 ft.
Gliding Angle	9 to 1
Cruising Range	600 miles

#### DESIGN CHARACTERISTICS

Wing Span	48 ft. 10 in.
Chord	7 ft.
Length over all	33 ft.
Height (extreme)	9 ft. 6 in.
Power Plant	Two 65 h. p. Le Blond
(3 motors)	One 90 h. p. Le Blond

Instruments:—Bank & Turn Indicator, Altimeter, Air Speed Indicator, Compass, Oil Pressure Gauges, Oil Temperature Gauges, Tachometers, Navigation Lights, Self Starters, Brakes.

Crew	1 Pilot
Passengers	5
Weight Empty	2085 lbs.
Useful Load	1615 lbs.
Gross Weight Loaded	3700 lbs.

**\$15,800 Complete**  
**Flyaway Los Angeles**

THREE 90 H. P. LeBLOND \$17,950

## KREUTZER TRI-MOTOR AIR COACH

SIX PLACE . . . DUAL CONTROL . . . CABIN . . . MONOPLANE

## JOSEPH KREUTZER CORPORATION

Executive Offices  
1801 S. Hope St., Los Angeles

Factory 353 Third Avenue  
Venice, California



## CONTACTS

By F. E. SAMUELS

**I** DON'T believe that I am exaggerating when I say that the First Annual Advertising and Display Dinner of the Southern California chapter of the National Aeronautic Association, held at the Los Angeles Chamber of Commerce Building, March 11th, was one of the biggest and most interesting meetings ever held in the annals of the Association. By actual count, over one thousand enthusiasts sat down to the banquet. All of the leading Western manufacturers, transport lines, flying schools, airports, and aviation accessories had "Hangar" tables, which were decorated by, and in accordance with, the branch of the industry represented. The speaker of the evening was Mr. Don Francisco, aviation advertising expert and vice president of the Lord, Thomas and Logan Company. Five professional vaudeville acts and a concert orchestra were furnished by courtesy of six different firms who were present.

**T**HE first annual spring series of air races at the Los Angeles Metropolitan Airport was inaugurated March 3rd and will continue every Sunday through March and April. The classified races are proving very popular, not only with the spectators, but with the pilots. The opening twenty-five-mile race, limited to planes with OX-5 motors, was won by Leslie Miller in a Travel Air; second, Howard Murchie, also in a Travel Air; and Earl Gordon in a Lincoln-Page, third.

**T**HE sale of a new Bach trimotored transport to Barney Oldfield was recently consummated. The ten-place Bach, powered with a Hornet at the nose, and two Comets at the sides, will be taken by Barney on a business trip to New York and other Eastern cities. Oldfield, who, with Major Monte Stone, recently made a survey trip to Mexico City, announced at the time the possibility of establishing a transport line between there and the Los Angeles Metropolitan Airport.

**T**HE Miller Flying Service has taken over new and larger offices in the heart of Los Angeles. The company is maintaining a theoretical school, designed as a preparatory course for those planning to enter practical flying or ground training. There are 53 students enrolled in the ground class at this time, and 32 students are taking flying instructions from George Miller, president and chief instructor of the Service.

**A** LETTER from Mr. Sherwood Johnson, Los Mochis, Sinaloa, Mexico, informs us that probably the largest and best equipped airport in the Republic of Mexico is under construction at that place. The present airport, which is being constructed by the United Sugar Companies of Los Mochis, has a length of 5,000 feet and a width of 1,200 feet. At each extremity of this main runway there is an arm extending at right angles, each arm being about 2,000

feet wide. The whole forms a field shaped like a shallow "U." The field is being fitted up with a rotating beacon, floodlights, hangars, service stations, etc.

**J**AMES WEBSTER, head of Rogers Aircraft and distributor for Stearman Aircraft, has informed me that Roy T. Minor, well known Southern California pilot, has recently been appointed Stearman airplane dealer for Glendale, San Fernando Valley and Antelope Valley. Minor was previously affiliated with the Associated Aircraft, and is one of our well known motion picture pilots.

**T**HE contracts have been given out for the building of the second unit of the Bach Aircraft plant, increasing the floor space to twice its original size. When this is completed, the plant will be one of the largest and best equipped airplane manufacturing plants on the West Coast.

**T**HE third unit of the Douglas plant is nearing completion, and by June first, the entire working staff will have been moved from the old plant on Wilshire Boulevard to the new plant at Clover Field, Santa Monica. Between six and seven hundred employees are working overtime and nights to fill orders.

**W**HILE on my rounds of the airports, I happened to ask Mr. Talbot of the California Aerial Transport if he was receiving any returns yet from his advertisement in the March issue of AERO DIGEST. He replied "I should say we are." Taking me into the office, he showed me by actual count 56 inquiries, received in less than a week. The magazine had only been distributed ten days at that time. Mr. Talbot went on to say. "As I have never advertised in an aviation magazine before, this being my first advertising experience, it was not hard for me to determine where these inquiries originated. I have had to engage an extra stenographer to answer the correspondence." His guarantee system must certainly be meeting the approval of prospective students.

**R**OGERS AIRPORT at present is attracting great crowds daily. The reason is the exhibition of the 20-passenger Keystone Patrician, with its 86-foot wing spread and its three Wright Cyclone engines.

**T**HE Pickwick Airways have leased quarters at the Grand Central Air Terminal for hangars, shops, office building and pilots quarters. Construction is to be finished April first, at which time the company starts its first regular service run between Los Angeles and San Diego. The company has also taken a 20-year lease at the Lindbergh Field at San Diego. Bach trimotor transports will be used exclusively by the Pickwick Airways. The company will have ten of these fast and luxurious Air Yachts by June 1st.

**L**ARRY FRITZ, who since the start of the Maddux lines has held the position of chief pilot, has resigned to take the position of superintendent of the western division of the Transcontinental Air Transport line. Larry is one of the best liked pilots on the West Coast and has the reputation of being one of our safest and most conservative pilots.

**T**HE transfer of Lieut. Burgess, for nearly three years commander of the Army Reserve Corps at Clover Field, Santa Monica, to the University of Illinois, R.O. T.C., where he will be in command of instruction, will cause regrets, not only to the Army pilots, but to everyone connected with commercial aviation in Southern California. A number of his friends have requested me to remember him in "Contacts," giving him their best wishes and wishing him success in his new command. Lieut. Sweeley, coming direct from March Field, has taken over the command at Clover Field, and from all appearances, will be a popular officer.


**A** WRIGHT WHIRLWIND J-5 engine owned by the Aero Corporation of California is claimed to have run 2,600 hours. The engine is in a Fokker Universal and has flown a distance equal to ten times the circumference of the earth. It has been serviced regularly every eleven hours and has had only three major overhauls.

**T**HE list of new employees who have joined the Aero Corporation of California personnel within the last month includes: Art Kirk, Elmer Little, Russell Tyrrell, F. F. Formby, Joe Tracy, Paul Briggs, Austin L. Shreve, Hilda Jarmouth and F. W. Hainey.

**T**HE roofs of 27 buildings on the Aero Corporation of California field have been painted with alternate stripes of black and orange to serve as a field mark for those flying over. The new administration building, which has been under construction on the Aero Corporation of California field for the past two months, has been completed and the executives and office personnel of the company has moved into the new quarters. Aside from having ten private offices, this building will serve as an airline depot for the Standard Airlines, Inc., which is operating between Los Angeles and El Paso, with the Aero Corporation field as the Los Angeles terminal.

**T**HE American Airplane Equipment Co., of Oakland, has recently put into production the levelometer, an instrument indicating the angular position of an airplane. The levelometer records either lateral or longitudinal angles, and registers up to 180 degrees.

**G**EORGE B. CRAIG CO., of Los Angeles has been reappointed factory representative and distributor of Mohawk Pinto planes throughout California.


 TRAIN AT AMERICA'S MOST FAMOUS AVIATION SCHOOL

*It means something to be a*

# RYAN GRADUATE



This scene is not an "Air Meet!" It is an actual photograph of a part of the flying equipment used by the T. C. Ryan Flying School. Note the large variety of modern licensed planes in which students receive flying experience.

## RYAN GRADUATES ARE EXPERT PILOTS . . . EXPERT PILOTS ARE IN DEMAND

There's a vast difference in aviation training. Investigate thoroly. Be sure you get the best. Hundreds of so-called flying "schools" claim they can turn out finished pilots in 10 hours' flying time. We tell you frankly—it CANNOT be done. A really competent pilot for *commercial* flying cannot be trained with less than 60 hours in the air and four months' ground training; a safe pilot for *private* flying cannot be produced with less than 20 hours in the air and two months' ground training.

Aviation experts will tell you that the T. C. Ryan Flying School at San Diego, California, is offering two of the finest flying courses in America. Ryan students—because of long, thoro training under ideal flying conditions, competent staff of licensed instructors and many types of licensed planes—are better qualified to fill the important flying and executive positions which are opening up on every hand.

### CLASSES NOW ENROLLING

No delays! Every day is a flying day in San Diego—the charming city on the edge of the blue Pacific. San Diego knows no winter, no sleet or slush or snow, no freezing temperatures, no high winds or serious storms. That's why two great U. S. Government flying schools and many other aviation activities are active here—every day in the year. Resolve to become a part of this fascinating activity NOW.

**NOTE:** All training is done under the personal supervision of T. Claude Ryan, pioneer of aviation for 12 years. Mr. Ryan is the original designer and builder of Ryan monoplanes, and founder of Ryan Airlines, Ryan Flying Co., T. C. Ryan Flying School and T. C. Ryan Aeronautical Corp.


 TYPICAL  
WINTER  
SCENES

in **San Diego**  
California  
*'Air Capital of the West'*


 RYAN'S  
STUDENTS IN  
FORMATION  
FLIGHT

### If Interested in Quality Training—You Are Invited to Send for Catalog

The T. C. Ryan School specializes in a complete course covering four full months—with 60 hours in the air and thoro ground training—qualifying you for a Commercial License.

Also a Private Operator's course, covering two months—with 20 hours in the air and primary ground training. Also *Advanced Work* for those who have had previous training.

T. C. RYAN FLYING SCHOOL, Dept. C, Ryan Airport, San Diego, Calif.  
(A Subsidiary of the T. C. Ryan Aeronautical Corporation)

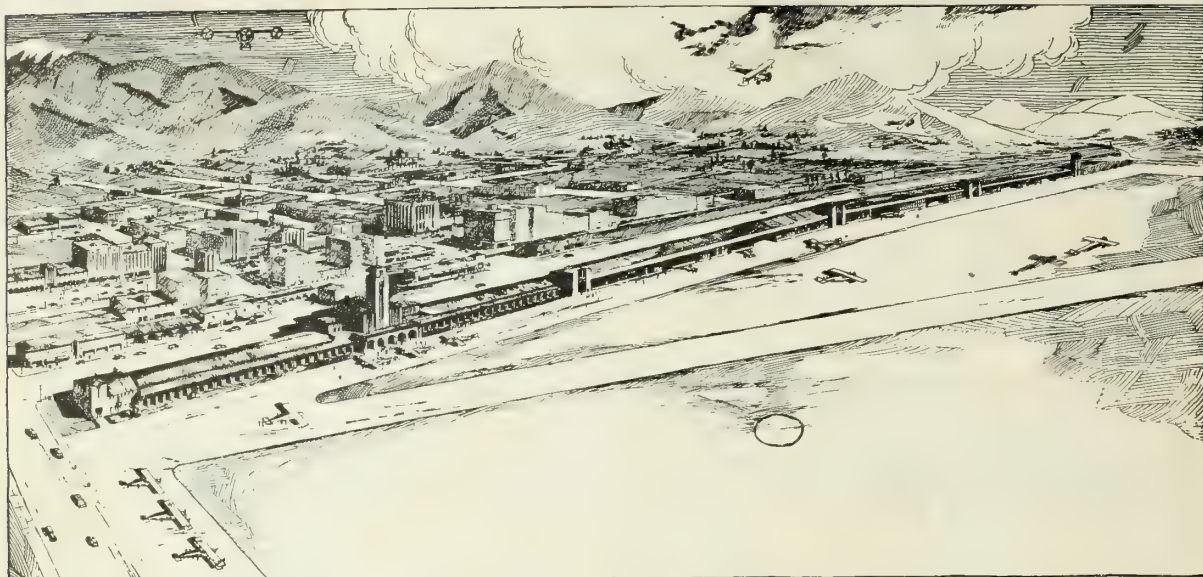
Gentlemen: I am interested in your course of flying instruction. Please send me your catalog.

Age.....

Name..... Address.....

Learn  
to fly  
with  
**RYAN**  
at the  
**T. C. RYAN**  
**FLYING**  
**SCHOOL**





Artist's sketch showing Grand Central Air Terminal at Glendale, California, as it will appear when fully completed.

## GRAND CENTRAL AIR TERMINAL

WITH certain stipulated rules laid down in advance, lessees of the Grand Central Air Terminal at Glendale (15 minutes by motor car from Los Angeles and 12 minutes from Hollywood business section) will have not only one of the finest airports in America—but a self-governed one as well.

Captain Charles Clyde Spicer, the builder and backer of the new terminal, has put up a bar forever against flying schools, students, unlicensed planes, unlicensed pilots, and stunting.

But henceforth, all rules and regulations of this field will be made by a committee or board of directors composed of one man representing each lessee and one man representing Captain Spicer. Every issue will be decided by a majority vote, and the airport manager will be empowered to enforce the rules or bring action to eject the offending tenant.

The inauguration of the airport on Wash-

ington's birthday brought 92 airplanes and a crowd estimated at 125,000. Probably for the first time in history, a fleet of seven trimotored planes flew in formation. They were ships of the Maddux Air Lines. Twenty special flights and other features rounded out the program, the main event of which was the arrival and introduction of over 200 prominent guests, with Governor C. C. Young heading the list and making the dedicatory speech.

One 3,000 by 72-foot concrete take-off runway, with 10-foot asphalt flanges, is to be lengthened to 4,500 feet as soon as the unfinished southeast end of the field is completely filled in and graded. Storm draining is completed. The inside street is being paved now. One 400-foot all-metal hangar with concrete floors and underground tanks is being used by Maddux Air Lines. Another 200-foot hangar is being used for transient planes until Pickwick Airways move in about April 10. Both are 130 feet deep. The Transcontinental Air Transport hangars are being built

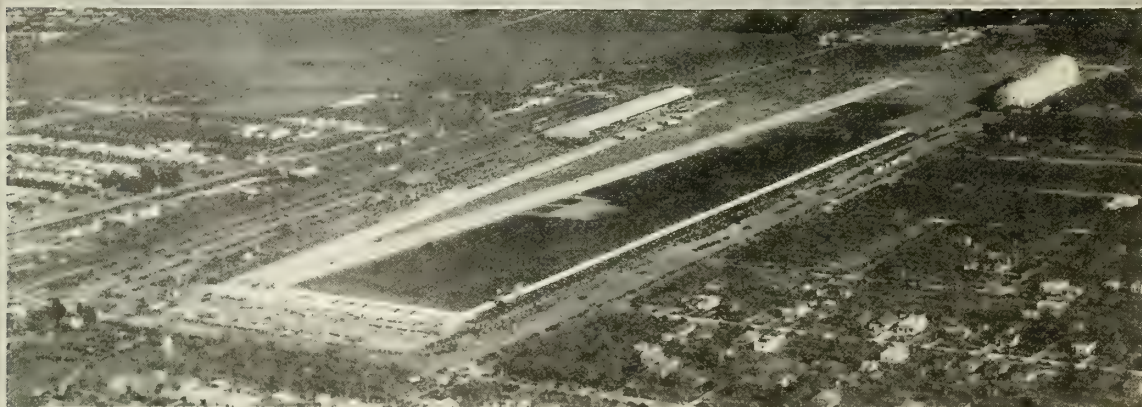
now. The general offices and base of Maddux Air Lines have been established at the terminal in buildings measuring 400 by 30 feet.

Coöperative shops are under construction for the use of outsiders, and within thirty or forty days, the 300-foot administration building and union depot, designed by H. L. Gogerty, will be under construction. This building will adhere to Spanish precedent in design. Eddie Brandstatter of Hollywood, famous cafe owner, has secured the lease for an airport cafe with cabaret entertainment.

Government sending and receiving teletype machines are in operation in the Maddux general offices, as well as similar machines for instant inter-office communication between Los Angeles, Glendale, Hollywood, San Diego and El Centro.

Public reception of the new terminal has been instantly favorable according to the public relations department of the Maddux system. The sightseeing business alone has

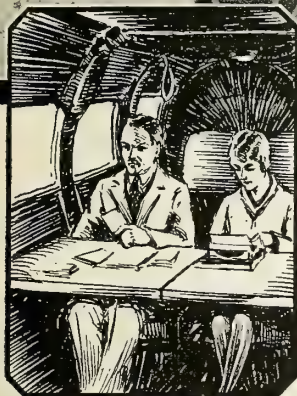
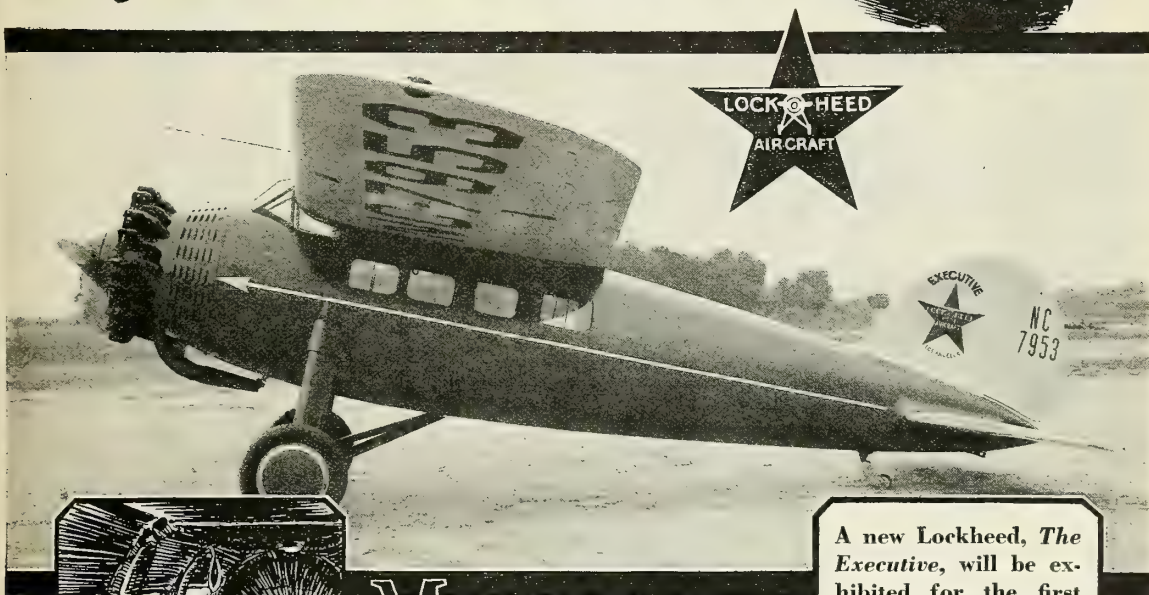
(Continued on next page)



Grand Central Air Terminal at Glendale, California, as it appeared at the time of its dedication.



# Announcing "The **EXECUTIVE**" by **LOCKHEED**



## Making the most of fleeting hours

Into the spacious cabin of the Lockheed Vega . . . record-breaking monoplane of unsurpassed performance . . . has been designed an unique interior arrangement of par-

ticular interest to executives who fly. ★ The unusual flight stability of the Lockheed has permitted as standard equipment in this new model a folding desk with Corona typewriter; seats, instantly convertible into a comfortable lounge; a lavatory, and a big compartment for golf clubs and luggage. ★ The monocoque fuselage of the Lockheed . . . an exclusive patent . . . reduces noise and vibration to a degree that dictation, typing, or taking a nap may now be included in the flying program of progressive business men and women who would make the most of hours spent in air travel. ★ This ingenious new model of the world's fastest and finest air transport, *The Executive*, when powered with either Wasp or Whirlwind engine, gives the same superior performance which has characterized the Wasp-Vega and Whirlwind-Vega. ★ ★ See *The Executive* at Detroit.

**LOCKHEED AIRCRAFT COMPANY..LOS ANGELES**

A new Lockheed, *The Executive*, will be exhibited for the first time at the Detroit Show. Inspection by business executives is invited. Complimentary stenographic service will be afforded at the exhibit to those wishing to send telegrams.

Whirlwind-Vega Approved Type Cert. No. 49

Wasp-Vega Approved Type Cert. No. 93

Wasp-Air Express Approved Type Cert. No. 102



(Continued from preceding page)

quadrupled, with 80 sightseers the first Sunday and a plane load daily on week-days, two planes some days, as against the high point of twenty sightseers on Sunday at the old field quarters and hardly any on week-days.

Captain Spicer, a veteran of the Spanish-American war, whose business connections

have always been in the bond and mortgage and real estate finance fields, had no previous aviation experience to aid in building the Grand Central. His brother, C. A. Spicer, one of the two engineers on the Coolidge Dam in Arizona, was construction engineer on the project, working out new theories of oil treatment, and a system of runways highly approved by Maddux pilots and individual fliers.

## PIONEER FLYING IN ARIZONA

By Harold G. Wilson

NINETEEN years ago, February 19, 1910, Arizona witnessed its first airplane flight. That thrilling hair-raising event, in which a heavier-than-air machine actually flew four and a half miles, was followed the next year by the visit of a transcontinental flier, who two days later was joined by another coast-to-coast flier.

Robert G. Fowler, first Pacific to Atlantic flier, was in Tucson when Cal P. Rogers, the first Atlantic to Pacific flier, came in from the clouds and landed his open-work plane on the university baseball field. In these days of overnight dashes from coast to coast, a transcontinental flight is relatively unhistorical, but in the fall of 1911, the arrival of these fliers marked a great historical meeting. By circumstance, Tucson became the meeting place for the first two successful coast-to-coast fliers, one headed east, the other west.

Back in those days, when Salt Lake City and Denver each paid \$20,000 to see Pahlman make a single three-minute flight, aviation was far different from what it is today. Tucson considered itself fortunate to be able to secure the services of Charles K. Hamilton at \$2,000. His appearance followed the first aviation meet ever held in the country, at Los Angeles, January 10-20, 1910. Eleven planes, three dirigibles and several free balloons were exhibited there.

On their way east three aviators, including Charles K. Hamilton, set up their planes at Phoenix, where the first flight in the state was made. Mr. Hamilton was then hired to come to Tucson, and he did so, bringing his plane with him on the train.

Elysian Grove, a boarded-in park, was selected for the flight, with the hope that the gate-crashers could better be controlled there.

The birdman Hamilton was a hero then, for he had lowered the world's record for one mile at Fresno the early part of that same month when he clipped four seconds from the one minute eighteen second record set in France.

The flight at Tucson was a breath-taking success. After taking off and gaining an altitude of 900 feet, the silk and bamboo contraption returned to a point in front of the grand stand and traveled at the rate of 40 miles an hour. That was a holiday in Tucson, and the business section of the city was decorated for the occasion.

In a flight made the following day, Sunday, the plane overran the small field and crashed into the fence. After the ship was repaired, a second flight was made, and again in land-

ing the plane overran the field and was damaged. The precious plane was once more repaired and shipped to El Paso where other flights were made.

The city's next great air thrill came with the arrival of Robert G. Fowler, October 30, 1911, transcontinental flier who made the first Pacific to Atlantic flight. The day before he reached Tucson he broke the world's sustained flight record by flying from Yuma to Maricopa, a distance of 165 miles, without stopping. A wing of the ship was damaged somewhat in landing on the university baseball field. Bulletins announcing the progress of the plane over railroad stations along the line were posted by a local newspaper.

But two days later, November 1, 1911, Cal P. Rogers, 27 days out of New York City, landed at Tucson, and was greeted there by Pilot Fowler and hundreds of citizens, enthusiastic with the honor of entertaining two such distinguished fliers. A special train,



Hamilton's plane flying at Tucson, 1910.

with spare airplane parts, followed Rogers on this trip.

"Well done, old man, it was a beautiful flight" were the words with which Fowler greeted Rogers.

Pupils of the Roskrige School were excused for the afternoon in order to be able to witness the arrival of the Rogers plane. The special train carrying supplies arrived 30 minutes after the plane had landed, unable to keep up with the winged ship, which made a speed which present day small planes could easily double at cruising speed.

Rogers' plane was the pusher type, with two propellers mounted at the rear of the wings. They revolved in opposite directions, and were driven from sprockets on the same engine shaft, with one chain crossed. Eleven rollers were lost out of one of the chains during the flight from El Paso to Lordsburg, N. M., but rather than risk a desert landing, the pilot flew on in spite of the ominous grind of the chains. Rogers continued his

trip via Maricopa and Phoenix to Yuma and thence to Los Angeles, to complete the first transcontinental flight ever made.

Pilot Fowler repaired his plane and set out for the East November 2, finally completing that flight, after repeated repairs to his type B Wright machine.

## ARIZONA AIR NEWS

By Harold G. Wilson

AIR mail for Arizona is the big problem confronting aviation bodies and air fans of the state. A call for bids for air mail to serve the Southwest between Dallas and Los Angeles via El Paso, Tucson and Phoenix was promised for the early part of this year, and it was understood that the call would be made shortly after the Hoover inauguration. Ten or more companies have indicated that they will compete for the contract.

WORK of clearing the Ajo airport is nearing completion, under the direction of a committee of the Ajo Chamber of Commerce, headed by W. J. Beaton. Two runways have been provided, and a concrete warming-up platform is being laid. It is expected that, with the completion of this field, a considerable portion of the Tucson to Yuma flights, which now usually follow the railroad to the north of Ajo, will be routed through this port.

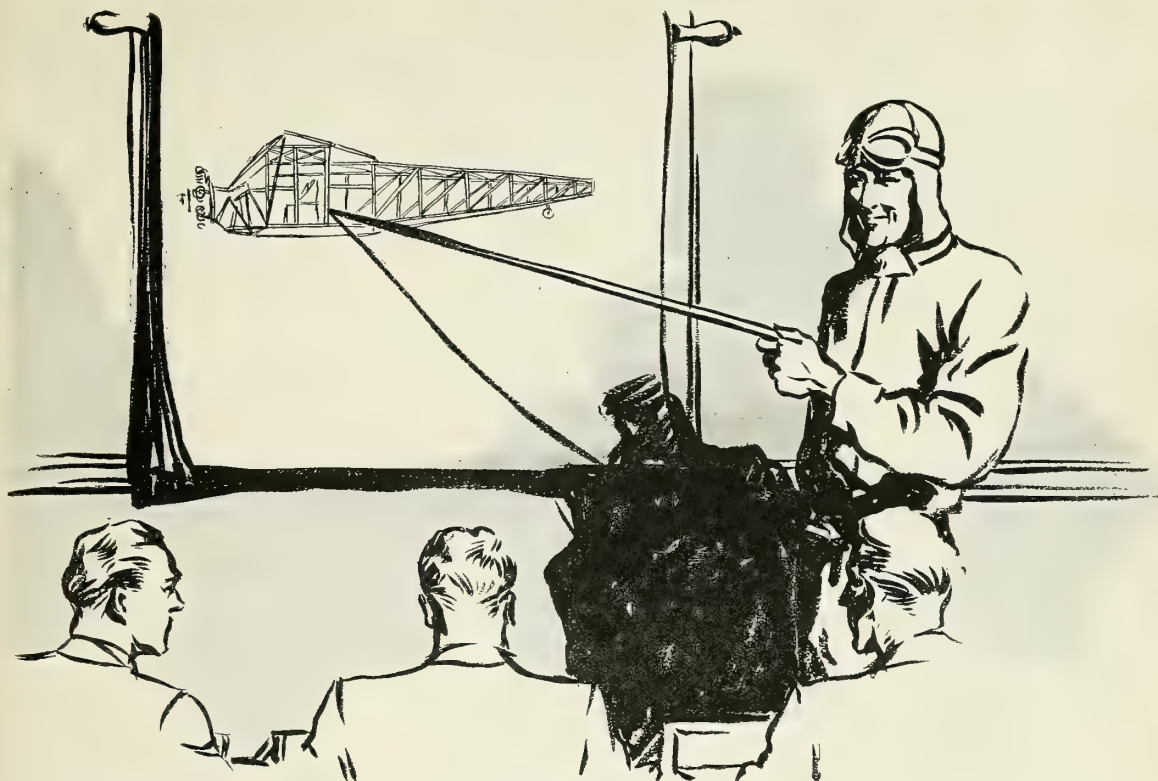
AN additional \$8,000 coffee shop, soft drink stand and dance pavilion has just been authorized for the Scenic Skyharbor, Phoenix. Lighting equipment is soon to be installed to make this a 24-hour field. A large hangar, with brick side walls, is under construction as part of an \$82,000 improvement program. The field is owned by Scenic Airways, Inc. Frank Southgate, former advertising manager of Arizona Highways, recently became advertising manager of the company.

DEDICATION of the Douglas-Agua Prieta airport, scheduled for April 6, has been postponed indefinitely because of the revolution which broke out in Mexico in March. Permission had already been secured from the Mexican government to allow leading Mexican fliers to attend the dedication of this international airport, which lies partially in the United States and partially in Mexico. The field has been equipped with floodlights, boundary lights, beacon lights and a passenger depot.

THE Standard Air Lines, Inc., which recently increased its tri-weekly service between Los Angeles and Tucson to daily service, and extended the line to El Paso, has leased tracts on the Phoenix, Tucson, Douglas and El Paso municipal airports.

CHANDLER'S new airport was formally dedicated March 13, with planes attending from all parts of the state. The field was completed and first used three months ago, but formal dedication ceremonies were

(Continued on next page)



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(Arizona Air News continued)

delayed until this time. Kirke T. Moore, Tucson, chairman of the state aviation committee, was one of the chief speakers at the dedication.

A RADIO station and aerial tower, costing \$20,000 is planned at Winslow, in the northern part of the state, by Transcontinental Air Transport. Similar stations are planned in the Southwest at Albuquerque, N. M.; Kingman, Ariz.; and Barstow, Calif.

UNITED AIR EXPRESS service was inaugurated in Arizona the latter part of February. By this service, patrons of out-of-town stores may secure deliveries in a hurry. The packages are placed on planes of the Standard Air Lines, Maddux Air Lines or Union Air Lines, and are called for by special messenger at the completion of the flight, to be delivered immediately.

TOMBSTONE is soon to have an airport. A survey has been completed and decision reached that the most logical airport site is the old race track. Two runways are being installed and other improvements made.

A GOOD-WILL flight through Arizona and to other points along the proposed route of the air mail service was made in March by a party of Pickwick Airline, Inc., Shell and Union Oil company officials. Capt. Robert Kennedy and Capt. William Frye piloted the trimotor Bach plane, the type they proposed to use in establishing an airline from Los Angeles to Dallas, late this spring. The company proposes to parallel its stage lines with air routes, using established depots and agencies to handle the business of both concerns.

THE first airport for Gila County is being constructed at Miami by Sidney E. Ross, who is also establishing a passenger taxi service and aviation school. A runway 2,800 feet long and 500 feet wide has been constructed. It will later be increased to 3,800 feet in length and 800 feet in width. Future plans call for the construction of a hangar and installation of night lighting equipment.

A BILL authorizing the state or any political subdivision thereof to establish and maintain airports, and providing for the issuance of bonds, has been passed by the Arizona State Legislature and signed by Gov. John C. Phillips. The measure authorizes condemnation proceedings, regulates aircraft, provides for licensing both aircraft and airmen and prescribes penalties.

A NEW temporary landing field has been cleared near Nogales, and is being used as the base of operations of the Koehler Flying School. The Nogales airport is located nearly ten miles northeast of that city, the distance being necessary because of the fact that Nogales lies in hilly country on the international border. The new field will be six miles due north of Nogales.

## OAKLAND AIR NEWS

By HOWARD V. WALDORF

A NEW type plane designed to eliminate the dangers of fire and forced landings is under construction at the plant of the Aeronautical Engineering Company in Oakland. The plane, a parasol type monoplane, is constructed in two parts; the wings, controls, landing gear, passenger and cargo compartments being in one unit and the engine and fuel tanks in the other.

In case of fire in the air or motor failure over dangerous terrain, the pilot releases ten patented locking devices, which hold the two units together and the engine and fuel tank section drops clear, leaving the remainder of the craft as a motorless glider, according to the theory of its inventor, Joaquin S. Abreu of San Francisco.

A TRIMOTORED sesquiplane has been selected by Major Livingston Irving and Junko S. Kubota for their proposed Oakland to Tokio and return good-will flight. Plans are now being drawn by Oakland and Los Angeles engineers, and construction is expected to start shortly. More than \$80,000 has been pledged for the flight by Japanese societies of California.

The plane is to carry fuel sufficient for a 55-hour flight and is to be powered with three Wright Whirlwind engines. The spread of the top wing is to be 65 feet. A retractable landing gear is to be used. The estimated performance is: top speed, 125 miles per hour, and cruising speed, 90 miles per hour.

The take-off of the good-will flight is set for July from the Oakland Municipal Airport. The itinerary calls for a landing at Honolulu and a non-stop flight of 4,000 miles from there to Tokio. The return flight is to be made via Seattle.

PLANS for the inauguration of a speedboat service to transport mail and passengers to and from downtown Oakland and San Francisco are being made following the completion of the dock and seaplane landing stage at Oakland Municipal Airport. A channel 16 feet deep and 300 feet wide connects the airport with San Leandro Bay and the tidal canal.

REPRESENTING a 100 per cent increase over the corresponding period of 1928, the February report of operations at the Oakland Municipal Airport showed 5,014 landings, 3,110 passengers and 685 student flights.

TRAVEL AIR sales at the Oakland Municipal Airport during a recent five-day period totalled \$28,000, according to D. C. Warren, agent.

A REQUEST for permission to build a railroad for ground transportation at the Oakland Municipal Airport has been filed with the port commission by the Pilots and Operators Association. Purchase of a miniature railway, formerly located at an

amusement park, is suggested by the pilots.

A. J. ANGELI, formerly chief mechanic for the Mutual Aircraft Corp., has joined the staff of the Aeronautical Engineering Company of Oakland.

INAUGURATION of two new flying services brings the total of commercial organizations basing at the Oakland Municipal Airport to 24. The two new services are operated by Clarence Selby and Henry Hurley. Al Pilgrim has been chosen as pilot for Selby's OX-5 Waco. Planes operated commercially from the Oakland flying field now total 55.

WAYNE SMITH and H. Art Reed, formerly with the Pacific Coast Air Service, have started a new flying service at the Oakland Municipal Airport. The service, specializing in instruction and sight-seeing flights, is known as the Smith-Reed Air Service.

A. D. JENSEN, head of the Sunset Flying Service, was elected president of the Oakland Municipal Airport Pilots and Operators Association at a recent meeting.

INTER-COMMUNICATION telephones have been installed at the Oakland Municipal Airport. Points connected by the new hookup include the administration building, the weather bureau, Boeing Air Transport, Pacific Air Transport, Western Air Express and the radio office.

### Alameda Notes

By Howard V. Waldorf

WITH more than 30,000 persons in attendance, the Alameda Airport was formally dedicated March 2 and 3 with an elaborate program. Thirty-five planes, including a squadron from Crissey Field, participated in the program.

The \$60,000 administration building, which contains eight hotel rooms, a restaurant, ticket offices, weather bureau, waiting rooms and administrative offices, was formally opened. Civic officials and representatives of several air transport companies took part in the dedication program.

Formation flights were staged by the Crissey Field squadron of Douglas O2s led by Lieut. Joseph Hargrove and a commercial squadron of Whirlwind-Stearmans led by Lieut. Franklin Rose of the Metro Air Service of Oakland Municipal Airport.

Winners of the flying events were: free-for-all 20-mile race, Art Ayres, Whirlwind-Stearman (time 10 minutes 1 second); 10-mile OX-5 race, Lieut. Norman Goddard, Waco; 15-mile OX-5 race, Lieut. Norman Goddard, Waco; shaving in air contest, Capt. W. H. (Bill) Royle; stunting contest, Basil (Blake) Russell; dead-stick landing, Norman Goddard.

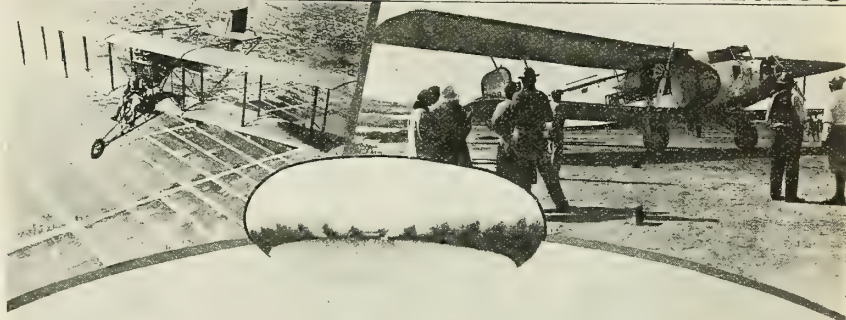
Approximately 100 acres of the 345 have been developed. Several runways have been completed. Two large hangars and seven individual hangars have been constructed.

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Worthington St., Springfield,  
Mass.  
Huntington Aircraft Corp., 1188  
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R. A. Gates, Granite State Flying  
School, Keane, N. H.  
American Aircraft Corp., 3809 An-  
geles Mesa Drive, Los Angeles,  
Calif.  
H. A. Hackett, 3140 Cudabo Street,  
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J. L. O'Donnell, Municipal Airport,  
Long Beach, Calif.  
Eddie Martin, Martin's Airport,  
Santa Ana, Calif.  
Callies Flyers, 332 Garfield, Men-  
terey Park, Calif.  
Dowling & Morris, 662 No. Golden,  
Fullerton, Calif.  
Ira B. Robers, Brawley, Calif.  
Club Aereo Mexicali, Mexicali,  
B. C., Cal.  
Cardiff & Peacock, Bakersfield,  
Calif.  
Palo Alto School of Aviation, Palo  
Alto, Calif.  
San Benito Flying School & Air  
Transport, Hollister, Calif.  
Merced-Wawona Air Lines, Merced,  
Calif.  
Paull & Smith, Salinas, Calif.  
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Alameda, Calif.  
J. P. Sales, Petaluma, Calif.  
Shasta Aircraft Co., Redding, Calif.  
Wyoming Airways, Inc., Casper,  
Wyo.  
Great Lakes Airways, Inc., 304 E.  
3rd St., Jamestown, N. Y.  
Spartan Aircraft Co., Inc., Tulsa,  
Okla.  
Aero Corporation of Arizona,  
Phoenix, Ariz.  
Cales Motor Co., Ralston, Okla.  
San Diego Air Service, Inc., Lind-  
bergh Field, San Diego, Calif.  
Nicholas-Beazley Airplane Co., Inc.,  
English at North St., Marshall,  
Mo.  
A. G. Spalding & Bros., New York,  
N. Y.  
Western Auto Supply Company,  
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geles, Calif.; 2355 Broadway,  
Oakland, Calif.; 1560 Broadway,  
Denver, Colo.  
Air Associates, Inc., Box No. 333,  
Garden City, N. Y.  
Soo Skyways, Inc., Sioux Falls,  
South Dakota.  
Pacific Parachute Service, Glendale,  
Calif.  
Frederick H. Becker, 72 Murray  
Lane, Port Washington, Long  
Island, N. Y.  
Aviation Schools, Inc., Seattle,  
Wash.  
Parmenter Flying Service, Cor-  
vallis, Ore.

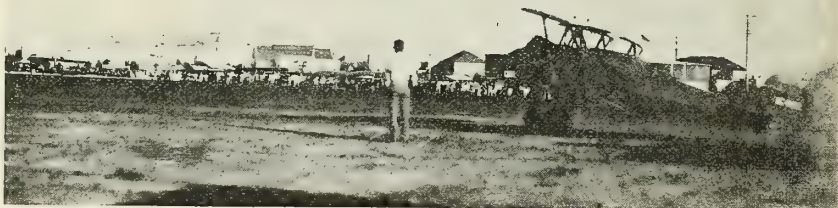
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## SACRAMENTO AIR NEWS

BY RALPH K. CLARK

**U**NDER the present Andrews-Morris lease, the General Aeronautics Service of San Francisco has taken over the municipal airport here. According to present plans, the city will purchase Andrews' and Morris' improvements on the field, which include a hangar and office buildings, and will re-lease the field to the General Aeronautics Service.

Bill Swayne has been placed in charge of the field by the new company. Its officers are: Capt. Burdette Palmer, president; T. R. Mitchell, vice president; J. W. Kelley, secretary; J. Connor, treasurer; and E. V. Vandercook, general manager.

**A**ERIAL flashlight pictures showing Washington, D. C., upon the eve of the presidential inauguration were received by the Sacramento *Bee* at the municipal airport after being delivered there by an Army plane from Crissey Field, San Francisco.

The pictures were taken by Capt. Albert W. Stevens in an Army observation plane flying at an altitude of 1,500 feet over Washington. They were developed while the aircraft was in flight and dropped in a lighted parachute message tube. They were then sent to San Francisco by telephoto.

Two hours after the pictures were taken over Washington, they were delivered at the Sacramento municipal airport.

**T**HE airport at the Galt High School is undergoing extensive improvements. Several tractors have been put on the job of building a new runway. A 300-foot circle is also being graded at the intersection of the two runways.

**A**T a recent meeting of the Sacramento Aviation Club, it was unanimously voted to affiliate the local organization with the National Aeronautic Association.

## CALIFORNIA NOTES

BY RUSSELL GRIGSBY

### Stockton

**D**IFFERENT types of floodlights are being tested out and night landings are made every night by Clayton Allen and the Stockton city engineers. It is their intention to equip the Stockton Municipal Airport with the very latest complete lighting equipment.

**L**ES ORANGES just received a new map from the Department of Commerce which has Stockton's airport marked in the wrong direction from town. The fact that we have so many level, open fields all around us, is confusing to the visitor, but we wish it clearly understood that Stockton's airport is located 3 miles straight south from the race track. An arrow painted on the roof of the Pacific Gas and Electric company's large gas holder and another arrow on the roof of the race track barn point toward the field.

Immediate improvements at the field are

to extend the oiled runway, and to oil the road leading to the field. Another hangar is badly needed now, for some of the boys have to stake their planes outside, and there is no room for transient visitors in the present hangar.

**E**IGHTEEN charter members organized the Stockton Pilots and Operators Association, for the advancement of aviation in this locality. Bert Lane was elected president; and Cliff Werely, secretary-treasurer.

### Galt

**F**LIGHT INSTRUCTOR GREGG has announced that 15 out of a class of 55 students are ready to solo at the Galt Junior College of Aeronautics. The boys are rebuilding a JN-4D from the ground up, to be used for solo work. They are also building a small sport monoplane with Anzani motor. This little plane is the design of Instructors Dobson and Gregg.

All cadets at the school wear snappy military uniforms. Out of approximately 1,000 flights, there have been no accidents or mishaps.

They expect to take delivery of a captive balloon, winch, and a lot of motor equipment, soon.

### Tracy

**A**N aviation meet will be held at Tracy's American Legion Airport, on April 26-27-28.

(Continued on next page)

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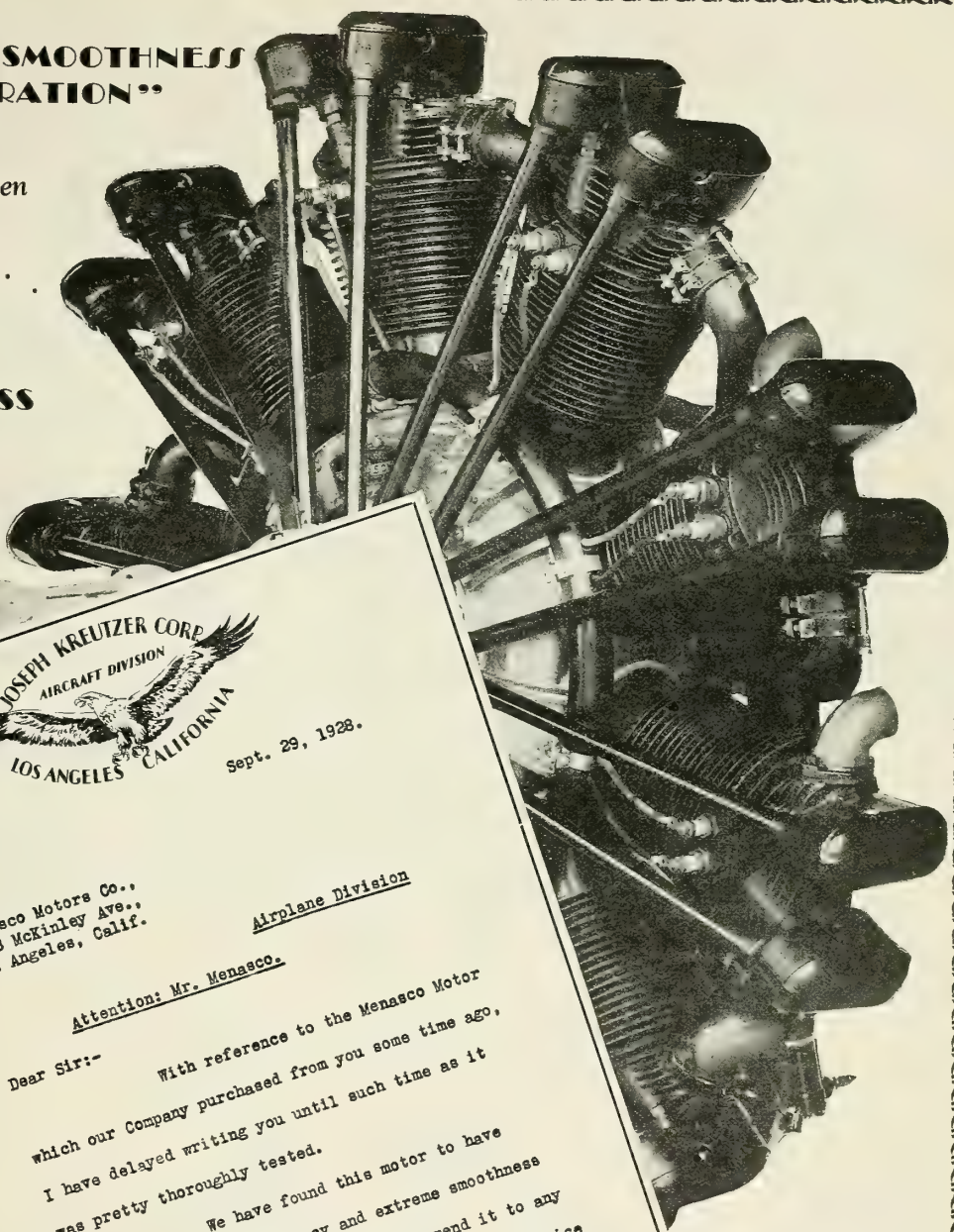
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JOSEPH KREUTZER CORP.,  
A.J. Edwards, Vice President.

**MENASCO MOTORS COMPANY**  
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(California Notes continued)

**Lodi**

**A** NEW flying field is being developed by Lind and Borth, 5 miles north of Lodi.

**Livermore**

**T**HE air mail emergency landing field northwest of town is being rapidly developed. The field is clearly marked by the Richfield Hotel and 8,000,000 candle-power aero-auto rotating beacon, illuminated wind pennant, landing lights, and border lights.

**NORTHWEST AIR NEWS**

By F. K. HASKELL

**A**CCORDING to James A. Polhemus, general manager of Port of Portland, the recent developments at Swan Island Airport have increased the value of the property to \$1,500,000. The airport has now more than 37,000 square yards of paving and five miles of hard surface road. Ample fire protection, water and electric service is provided. Further extensive lighting of the airport is now being worked out, and on completion of this improvement, it is expected the Federal Government will place lights along the Columbia Gorge.

**T**HE first Loening amphibian of the fleet to be put on the Seattle-Juneau run by the Gorst Air Transport, Inc., has been christened *The Alaskan*.

**S**PECIALY constructed skis, perfected by Frank Kammer, proved most satisfactory during the recent snow, according to L. L. Brunning, distributor for Alexander Eaglerock Aircraft Company.

Mr. Brunning is now completing the line-up of Eaglerock dealers throughout the Northwest.

**T**HE Aero Club of Oregon recently arranged an aeronautical program at the University of Oregon. Tex Rankin spoke on "Development of Airports in the United States," and Captain Herbert spoke on "Aviation."

**D**IRECT air mail and passenger service out of Portland to the East will be inaugurated June 1st, according to Leon D. Cuddeback of Boise, Ida., vice president in charge of operations of the Varney Air Lines. Effective with this change—moving of the western terminus from Pasco, Wash., to Portland, Ore.—a huge hangar will be erected on Swan Island for use in housing planes and shops of the company.

In addition, the company will open a night service out of Portland, which will mean the saving of a business day over the present schedule to the East. The mail will then fly two nights and one day, instead of two days and one night, as at present.

**E**XPANSION of the Continental Airways, Portland aerial mapping firm, was recently announced by the new owners, headed by T. V. Arnreiter, general manager. As-

sociated with him are Capt. Frank O. Mercer, Lieut. Gordon E. Mounce, C. E. DeBusse, Dr. W. A. Allen, Reid W. Allen and W. C. Saunders.

During the past year, this company mapped extensive areas for several corporations, including timber owners, railroads and hydroelectric companies. Judging from contracts now on hand, the company's pilots will reach a total of 1,500 flying hours during the coming season.

**T**RANSPORTATION of diamonds from the mines to Cape Town, is but one of the many uses being made of planes in South Africa, according to C. M. P. Cross, United States consul, who was a recent visitor here.

**A**LEXANDER KLEMIN, professor of aeronautics at the Daniel Guggenheim School of Aeronautics at New York University, was elected recently to the board of directors of the Rankin System, Inc., of Portland, Oregon. He will act as consulting engineer and technical advisor both in connection with the Rankin System of Flying Instruction, and in the design and manufacture of the airplane to be built by the Aircraft Builders Corp., a subsidiary of the Rankin System, Inc.

**B**OEING AIRPLANE COMPANY is building eighteen-passenger planes to be placed in service on the Chicago-San Francisco Bay Route. These planes, weighing

(Continued on next page)

# FIEUZAL-FUMO

(Green Tint)

(Smoke Tint)

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## SUMMER SUN

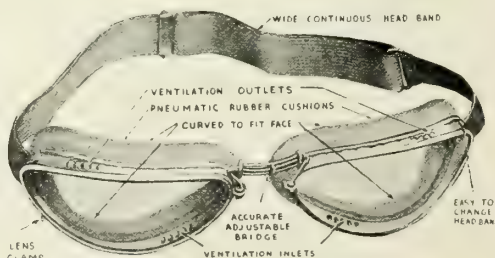
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(Northwest Air News continued)

8¼ tons, will be powered by three Pratt and Whitney Hornet engines with a total of 1,575 horsepower, and will have a speed of 135 miles per hour.

THE Boeing Airplane Company of Seattle reports one of the largest stocks of raw material and purchased items carried by any airplane manufacturing concern in their stock rooms. The inventory totals \$250,000.

DUE to increased activities, the personnel of the Boeing Airplane Co. factory at Seattle has been increased to 1,300. The brazing and welding shops now employ 232 skilled workmen in brazing, welding and assembling parts made in the machine shop.

THE Chicago-San Francisco Bay air mail route calls for night flying between Chicago and Wyoming points, or 46 per cent of the total mileage. This represents more night flying than is now registered in England, France and Germany, according to figures compiled by the Boeing Air Transport, operators of the line.

SPOKANE is acquiring more land for its municipal airport, Felts Field. Condemnation proceedings are now under way to give title to this property adjacent to the present field to the airport.

THE State of Washington has adopted an air code providing that no pilot can obtain a license from the state until he has first obtained a Federal license.

## WASHINGTON AIR NEWS

By C. M. LITTLEJOHN

THE initial step to regulate aircraft and flying is being taken by the state legislature at Olympia, with a bill to outlaw pirate planes at the municipal airport at Seattle. This aviation bill would restrict use of the airfield to regularly licensed craft. It also includes uniform rules and regulations for flying in the Northwest state.

CAPITALIZED at \$50,000 the International Airways, Inc., was recently incorporated at Seattle. Incorporators of this new air enterprise are P. T. McCarty, J. W. Graham and E. J. A. Burke.

A HUGE Neon beacon light, visible for 75 miles, is to be erected in Aberdeen by the Shafer Brothers Lumber & Door Company.

A NEW glider club has been formed at Fort Lawton, Seattle, where a part of the Army is garrisoned. Thomas D. Stimson, wealthy aviation enthusiast of Seattle, is backing the new glider club.

AT Bellingham a committee has been elected to proceed immediately to plan for either a municipal or county airport. There were four prospective fields mentioned recently by R. C. Lindburgh, of the American Legion in that city, and one of these sites may soon be selected.

THE new Seattle to Alaska plane service is now planned to be opened this summer, but the exact date may depend on whether or not Col. C. A. Lindbergh opens this new service.

Several Loening amphibian planes are to be turned over to the Gorst Air Lines, Inc., of Seattle, for the inauguration of this service.

THE Rainier Aeronautical Corp. is a new Seattle corporation. Incorporators are Kenneth C. Beuffer, Arthur J. Lee, Willard G. Von Rumble.

Headquarters for the Rainier Corporation have been established at Boeing Field. The company will engage in instruction work and other flying activities.

UNION AIR LINES, another Seattle-Juneau line besides that mentioned above, is to be inaugurated at Seattle. Charles V. Eakins is president. Mr. Eakins has placed orders for a fleet of three twin-engined Douglas flying boats with a passenger capacity of sixteen.

AIR TOURS, INC., of Boeing Field, Seattle, has inaugurated a new sight-seeing service, or acquaintance with the air tours, for first fliers. School children of grade and high school age are catered to and may get their first thrill for small sums. Six-place Stinson cabin monoplanes are used. All passengers are insured. In order to

(Continued on next page)

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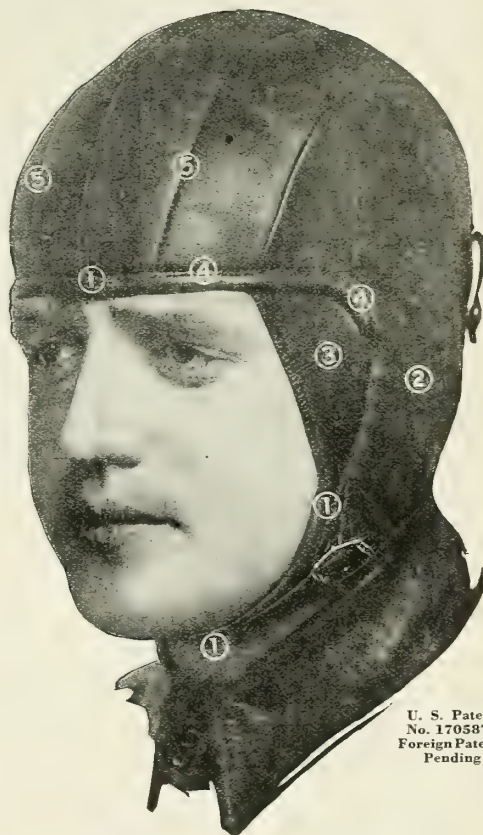
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(Washington Air News continued)

merchandise these tours and make them popular with the school children, the Air Tours, Inc., passes out buttons to the kiddies who have had a ride.

**CAPT. IRA C. EAKER**, chief pilot of the *Question Mark*, was a recent visitor at the plant of the Boeing company, which he inspected and praised for its facilities and efficiency. While in Seattle, he tested the new Boeing Fighter made for him, a ship that travels at the rate of 188 miles an hour. He used this plane on his fast flight from Brownsville, Texas, to the Panama Canal Zone and return.

#### Mamer Company Expands

WITH the purchase of the hangars, real estate, and planes, of the Yellow Air Lines of Spokane, the Mamer Flying Service of that city has enlarged its activities. The purchase increases its fleet of planes by six, which, with a Ford trimotor to be delivered in April, will number twelve planes to be used for instruction, taxi and passenger service, air transport, and aerial advertising.

The deal included the distributorship of Curtiss-Robin planes. Mamer Flying Service is also distributor for Buhl airplanes, and dealer for the Stearman.

**TACOMA AIRWAYS**, of Tacoma, Wash., using the Rankin System of Flying Instruction, has its own flying field for training purposes. This flying school, which is



**Capt. Eaker and Erik Nelson of the Boeing Airplane Company.**

entering its second year of operation, maintains its ground school in the business district of Tacoma, using the field outside the city for flight. Officers of the organization are: Miss Esther Coleman, president; S. M. LeCrone, business manager; Art and Barney Glein, in charge of instruction, and Don McKinnon, in charge of the ground school.

#### Crary Joins Boeing

**HAROLD CRARY**, who went to Chicago seven months ago to organize a central publicity office for the American Air Trans-

port Association, has resigned to become advertising and publicity manager of the various Boeing enterprises, including Boeing Airplane Company, Boeing Air Transport, Inc., and Pacific Air Transport, Inc., which are units of the United Aircraft and Transport Corporation, which also includes the Pratt & Whitney Aircraft Corporation and the Chance Vought Aircraft Corporation.

Winsor Williams, former New York-Chicago newspaper man and now assistant secretary of the Chicago Aero Commission, will carry on Mr. Crary's work in the Chicago office. The traffic committee to supervise the publicity, traffic and trade association activities at the Chicago office of the Association, as appointed by Col. Paul Henderson, Association president, consists of G. S. Childs, vice president and general manager, Pitcairn Aviation, chairman, and H. M. Hanshue, president of Western Air Express, and W. G. Herron, vice president Boeing Air Transport.

When Mr. Crary came from the Pacific Coast, where he had wide newspaper experience, together with the Chamber of Commerce publicity and organization experience, the American Air Transport Association's promotional activities were merely plans and there was no central office. A committee was named to establish this central office and choose someone to open and organize it, and Mr. Crary was chosen for the work. His achievements with the A.A.T.A. undoubtedly foretell his success with the Boeing enterprises.

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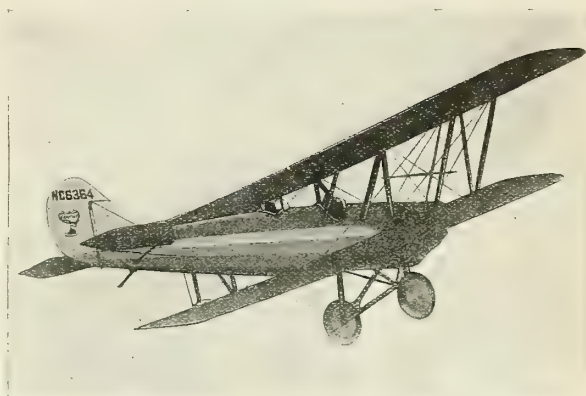
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## OREGON AIR NEWS

By C. K. LOGAN

THE state board of higher curricula will be called upon to pass upon a new aviation course to be offered by the University of Oregon as a result of recommendations made by the faculty following a study of aeronautics. The faculty is aided by an advisory committee composed of M. E. Wright, Portland; George Love, head of Aircraft Builders, Inc.; Herman Hobi, head of Hobi Airways, Inc.; Major G. L. Eckerson of the Hobi company; William G. Boeing, Seattle; E. W. Wells, observer of the U. S. Weather Bureau at Portland; Seeley Hall, manager of the Medford airport; and Earl Simmons, Eugene. Three types of courses will be offered; a short course in connection with the Hobi company, which holds a lease upon the Eugene municipal flying field; a two-year course for a junior certificate, and a four-year course for a bachelor of science degree. Regular work at the university includes such courses as mathematics, meteorology, astronomy, physics, thermodynamics, manufacturing, personnel and traffic management in addition to other courses which will be added to fit in with training in various phases of aviation.

CHASE GARFIELD, JR., of Portland, has been appointed to the aeronautical department of the Pacific Finance Corporation for the Northwest. Garfield was form-

erly sales manager for the Rankin Flying service and later was associated with Aircraft Builders, Inc.

TEST flights of a three-place cabin monoplane were made in March by its designer, Lee U. Eyerly, of the Eyerly Aeronautical School, Salem. The ship is equipped with a seven-cylinder 100-horsepower Siemens-Halske radial motor.

WITH the recent inauguration of an air express service in February, Medford, Ore., is now being supplied with the new service operated by the United Air Express.

## COLORADO AIR NEWS

By ROBERT C. CLEMINSON

AT the recent Denver auto show, the Colorado Airways exhibited one of their Hisso Waco planes. Free tickets to the show were dropped daily over town from a plane piloted by Colorado's only licensed woman pilot, Mrs. Anthony F. Joseph, wife of the president of Colorado Airways.

FOR the past three months, the Denver *Post*, has been devoting a full page to aviation each Sunday. The paper publishes pictures and descriptions of new types of planes or inventions pertaining to planes, technical articles, and new items. It also invites the public to ask any questions regarding aeronautics. These questions are answered by Lieut. Dan Kearns of the Col-

orado National Guard and published each Sunday.

Fred G. Bonfils, publisher of the *Post*, has offered a \$50,000 prize to the first non-stop flight around the world.

THE airport at Otis was opened on March 16. The town council has leased a tract of 80 acres about a mile north of Otis.

E. V. McCORY is flying Warren Procer's Hisso Eaglerock from the old Alexander airport at Englewood.

THE Daniel Guggenheim School of Aeronautics at New York University has been selected as the college to which the winner of the Alexander Eaglerock award for 1929 will be sent for a four-year business or engineering course in aeronautics. The committee of awards, which will select the winner, will include Prof. Alexander Klemin, chairman; Dr. Jesse Morgan, dean of the Colorado School of Mines; J. Don Alexander, president of the Alexander Aircraft Co., and Dr. Darell Boyd Harman, of Colorado College.

ALEXANDER AIRPORT at Colorado Springs has among its facilities for visiting pilots a 10,000-gallon underground gasoline tank, field men in attendance, and repair and hangar service for all planes in the Alexander Eaglerock factory adjoining the airport.



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These pontoons have seen very little service and have been stored carefully. Would suggest that you wire immediately for details to Aero Digest, Box 4—100.

## UTAH AIR NEWS

BY GLEN PERRINS

WITH the work on the lighting system west of Salt Lake showing rapid progress, plans are now being completed for the establishment of a double service over the Boeing Air Transport line between San Francisco and Chicago, according to D. B. Colyer, vice-president in charge of operations. The entire route east from Salt Lake has been lighted for some time.

MORE than 1,500 pounds of food were successfully delivered from the air by Edmund T. Allen, Boeing Air Transport pilot, who went to the rescue of the construction outfit working on the natural gas pipe line near Rock Springs, Wyoming. Since

highways were blocked with snow at Rock Springs and Rawlins, the construction crew's food supply was running low.

THE Idaho Senate has passed the house airfield bill authorizing counties, highway districts, cities and villages to purchase, or otherwise acquire, land (not to exceed 640 acres) for construction and maintenance of landing fields for aircraft.

These districts may levy bonds for maintenance of the property.

A PLANE sent from Salt Lake recently took supplies to stranded truck drivers in the Red Desert of Wyoming. When a fleet of 23 trucks was hopelessly stalled in the snow, half a ton of food and blankets was safely dropped to the marooned parties.

## MONTANA AIR NEWS

BILLINGS Air Transport, Inc., of Billings, Mont., has announced the purchase of Partington Skyways, the distributorship of the Barling NE-3 airplane, and plans for the beginning of three new flying schools in its program of expansion. Lieut. V. R. (Luke) Lucas has recently joined the firm to take charge of flying instruction.

Billings Air Transport is now operating three training schools, at Billings, Glendive, and Terry, and does passenger carrying from the Billings Airport. The officers of the concern are R. G. Woodard, president; Earl W. Hale, vice president; Glenn Woodard, secretary-treasurer; and Lieut. V. R. Lucas, chief instructor.

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**T**HE opening of the Detroit Air Show in April marks another milestone in the rapid ascent of aviation. Thousands upon thousands will flock to see the exhibits, will be thrilled at the sight of giant tri-motored planes, beautifully equipped amphibians, smart looking cabin jobs, and the trim, speedy, open cockpit planes.

Business men, industrial executives, and men of wealth and vision will place orders for hundreds of planes at this Show. And another cry will go up for more trained pilots, more trained mechanics, more aeronautical executives to man and manage this addition to an already seriously undermanned, surging, young industry.

No other business offers you, as a red blooded American, such a wonderful opportunity for advancement. Aviation is growing so fast that the men who start their training now must fill the responsible positions a few months from now. Hundreds of pilots' and mechanics' jobs at excellent salaries are always open. All that

you need to get one is an alert mind, physical fitness, ambition to push yourself ahead, and the training that you will get at Parks Air College.

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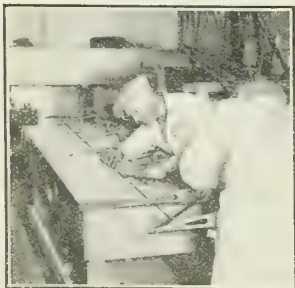
Aviation is a young man's industry. It's full of the spirit of youth, of soaring progress. It's healthful, pleasant, out-of-doors work, full of the spirit of conquering romance. And it's profitable far beyond the dreams of the young man whose business career is just dawning.

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Parks Air College leads all others, not only in enrollment, but in the number of graduates, the thoroughness and meticulous accuracy of its training, and the completeness of its up-to-date flying and ground equipment.

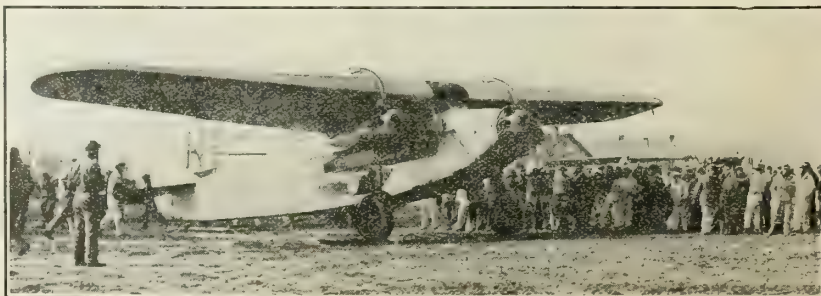
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*A big tri-motor plane arrives at Parks Airport.*



*Upper photograph shows a Parks Pilot instructing a student.*

*Lower: Students constructing a metal aileron.*





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Parks Air College is the first school in America to offer a course in Commercial and Aerial Photography. \$10,000 has been spent on equipment, and an expert instructor with twelve years of experience will be in full charge. All phases from the rudiments of commercial photography—classroom and laboratory—to the advanced map-photography with 252 hours in Aerial Photography will be given. Graduates from this course will be qualified experts open for large salary jobs in a new unlimited field.

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# AERONAUTICAL INDUSTRY

## GULF AIRLINES-TEXAS AIR TRANSPORT MERGER

By HAROLD A. DEMPSEY

**A**NNOUNCEMENT of the merger of important air mail and passenger routes in the South was made during the past month.

The new concern has been given the name Southern Air Transport, Inc., under the laws of Delaware and has acquired the entire outstanding common capital stock (with the exception of twelve shares) of the Texas Air Transport, Inc., the Dixie Motor Coach Corp., Texas Air Transport Flying Service, Inc., Texas Air Transport Flying School, Inc., the Texas Aeromotive Service, Inc., and the Gulf Air Lines, Inc.

The merger was completed in New Orleans after a month of negotiating. It was executed by Alva P. Barrett, former president of the Texas Air Transport, Inc., of Fort Worth, Texas.

In a statement following the announcement of the merger, Mr. Barrett said:

"Our purpose in creating Southern Air Transport is to unify schedules of passenger and express service throughout the entire South. We will operate passenger and mail service from Atlanta through Birmingham, Mobile, New Orleans, Beaumont and Houston to Brownsville, and another route from Atlanta through Birmingham, Jackson, Vicksburg, Monroe, Shreveport, Dallas and Fort Worth to El Paso.

"The route from Atlanta to Brownsville will form an important link in the Pan American all-land route by air from New York, through the South, to the Rio Grande and thence through Mexico, Central America and on to South America."

Mr. Barrett is president of the new corporation, which controls all mail and passenger routes in the Southern states, except the Pitcairn lines which operate between New York City, Atlanta and Miami. Headquarters of the Southern Air Transport, Inc., will be located in Fort Worth. C. R. Smith has been named treasurer. Ernest V. Moore of Atlanta was accredited the suc-

cessful termination of negotiations by effecting the consolidation of the Gulf Air Lines with the Texas companies.

James C. Willson, of New York and Louisville, has been chosen chairman of the board of directors of the corporation. Other members of the board are: Z. D. Bonner, San Antonio; Frank B. Black, Chicago; Walter H. Beach, Wichita, Kans.; J. Cheever Cowdin, New York City; W. T. Carter, Jr., Houston; C. E. Gillham, Fort Worth; Clark Howell, Jr., Atlanta; Col. Paul Henderson, of National Air Transport, Inc.; Tom Hardin, Fort Worth; C. S. (Casey) Jones, President Curtiss Flying Service, Inc.; T. K. Jackson, Mobile, Ala.; Frank M. Kemp, Dallas; J. Robert Neal, Houston; E. P. Smith, Chicago; C. R. Smith, Fort Worth; C. O. Yoakum, Birmingham, Ala.; James P. Butler, New Orleans; S. W. Souers, New Orleans; and Eli T. Watson, New Orleans.

## "QUESTION MARK" FLIGHT OFFICIALLY RECOGNIZED

**N**OTICE was received on March 14 by the contest committee of the National Aeronautic Association that the refueling flight record of the *Question Mark* has been recognized as a new world record by the Federation Aeronautique Internationale. The record is in "Class C category, refueling in flight and returning to place of departure." The flight was 150 hours, 40 minutes in duration.

## LOUISIANA AIR MAIL ROUTE

**B**IDS for an air mail route from New Orleans to Pilotown, Quarantine, or Port Eads, Louisiana, were received by the Postmaster General on March 23. Planes on the new route, which will connect with foreign mail steamers, will carry a maximum load of 800 pounds and make one round trip daily, except Sundays. The contract will run for one year.

## SOUTH AMERICAN MAIL ROUTE

**A**IR mail service to connect Miami, Fla., with Mollendo, Peru, over a 4,300-mile route will be inaugurated April 1 by Pan American Airways and Pan American-Grace Airways. The new route, which is preliminary to the Cristobal-Santiago service recently awarded to Pan American-Grace Airways by contracts from the Post Office Department, will connect the United States with the capitals of ten Central and South American countries.

Closing the last 950-mile gap between Ecuador and the Panama Canal Zone, the new service puts into operation the major portion of the new Canal Zone-Santiago air mail route, and links the 1,400-mile Pan American-Grace airline from Mollendo to Ecuador with the 2,000-mile Pan American Airways line from the Canal Zone to Miami.

The new route will serve Havana, Cuba; Belize, British Honduras; Tela, Honduras; Puntarenas, Costa Rica; Managua, Nicaragua; David, Panama; Cristobal, Canal Zone; Buenaventura and Tumaco, Colombia; Esmeraldas and Guayaquil, Ecuador; Talara, and other cities of Peru to Mollendo.

According to present plans, service over the 4,326-mile air route is scheduled to require 40 flying hours. Divided into easy daylight schedules, the new system will provide a seven-day air mail service between Mollendo, the farthest point on the air routes, and the United States, saving 8 to 30 days over the best steamer service.

The first plane over the new airlines will leave Pan American Airport, in Miami, on Monday morning, April 1, arriving at Cristobal, after overnight stops in Belize and Managua, on Wednesday afternoon. Leaving the Canal Zone the following morning the plane will reach Buenaventura, Colombia, the same afternoon and will arrive in Guayaquil Friday afternoon. Transferring the air mail to a Peruvian Airways Corporation plane at this point, the service continues to Talara, Peru, the following morning, to Lima that night and to Mollendo, on Sunday afternoon.



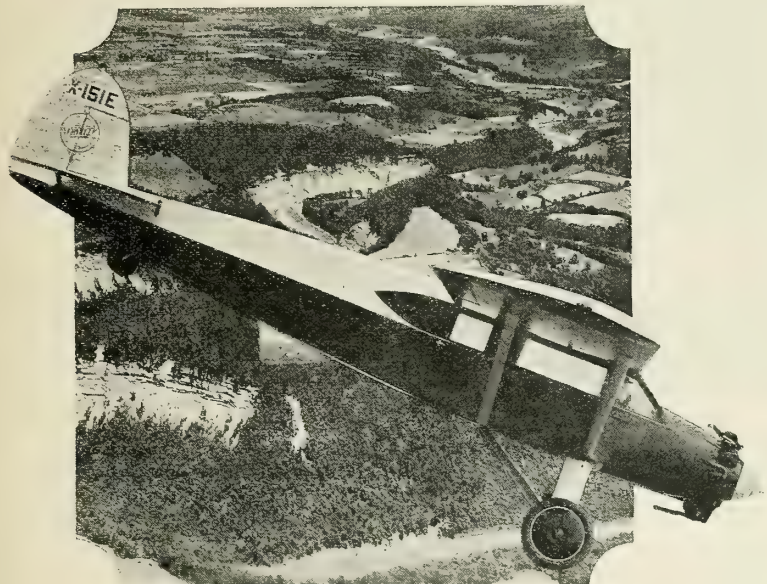
Administration building of the National

Committee for Aeronautics at Langley Field, Va.

© National Advisory Committee for Aeronautics

V.A.C. — V.A.C. — V.A.C. — V.A.C. — V.A.C. — V.A.C. — V.A.C. — V.A.C. — V.A.C. — V.A.C. — V.A.C.

## A Worthy Descendant of An Illustrious Tree



These qualities are inherent in the  
Verville Air Coach:

- ★ Performance
- ★ Stability
- ★ Controllability
- ★ Aerodynamic fineness
- ★ Perfect streamlining
- ★ Low Initial cost
- ★ Low maintenance cost
- ★ Accessibility
- ★ Serviceability
- ★ Quality

THE newest Verville production is the Air Coach, a four place, side-by-side dual control, semi-cantilever cabin monoplane . . . the result of fourteen years' cumulative experience in the design and construction of all types of successful aircraft. Embodying a number of original structural and design features, the Verville Air Coach also incorporates, in twentieth century manner, the various outstanding points of previous Verville craft. ¶ The cabin of the Air Coach in size, lines and appointments, is comparable to the finest custom-built motor car. Two doors, aft of the rear seats, provide rapid and convenient exit and entrance. Rich red and gray Laidlaw broadcloth upholstery; two large skylights; attractive carpeting; electric lights; Pittsburgh Duplate shatter-proof sliding plate glass windows; four convenient sidepockets for tools, maps, etc.; Turnstedt hardware—all add to the luxury and comfort of the cabin interior. ¶ A detachable motor mount accommodates several different power plants—among them the 5 and 7 cylinder Wright models, Warner "Scarab" and Curtiss "Challenger." Standard equipment includes Oleo landing gear; Bendix brakes; Aerol shock strut equipped tail wheel; Goodrich tires; Flightex fabric; exhaust collector ring; navigating lights; silencer; cabin heater; ventilator; 27"x9" crackle varnished dural dash board containing turn and bank indicator, climb indicator, compass, air speed indicator, oil pressure gauge, oil temperature gauge, altimeter, clock, instrument lights, all light switches and Scintilla magneto switch. Except for the magneto switch all instruments are Pioneer. ¶ The Verville Air Coach will be on display at the All-American Aircraft Show, where dealers' and distributors' franchises and discounts will be negotiated. Be sure to visit us.

## VERVILLE AIRCRAFT COMPANY

Detroit, Michigan

V.A.C. — V.A.C. — V.A.C. — V.A.C. — V.A.C. — V.A.C. — V.A.C. — V.A.C. — V.A.C. — V.A.C. — V.A.C.



## STATISTICS ON AIR TRANSPORT (AS OF MARCH 1, 1929)

### Air Mail Lines

Contractors operating .....	22
Lines in operation .....	37
Lines in operation and to operate .....	40
Miles mail lines operating .....	17,470
Miles mail lines operating and to operate .....	18,632
Average miles flown daily with mail .....	32,806
Average miles flown daily with mail and to be flown .....	35,045
Pounds mail carried 1927, including 3 foreign lines .....	1,654,165
Pounds mail carried 1927 on internal lines, contract and P. O. .....	1,449,364
Pounds mail carried 1927 on internal lines by contract .....	1,065,498
Pounds mail carried Jan.-June, 1928, internal lines by contract .....	1,054,729
Paid contractors 1927 on internal lines .....	\$2,561,268
Paid contractors 1927 on all lines .....	\$2,643,454
Paid contractors Jan.-Sept., 1928, on internal lines .....	\$4,342,594
Miles flown with mail 1927 all mail lines including P. O. .....	5,661,925
Miles flown with mail Jan.-June, 1928, on all lines .....	3,202,576
Trips scheduled 1927 internal contract lines .....	7,974
Trips scheduled Jan.-June, 1928, internal contract lines .....	6,452
Average income per scheduled trip 1927 on internal contract lines .....	\$320
Average income per scheduled trip Jan.-June, 1928, internal contract lines .....	\$346
Pounds average load per scheduled trip 1927 internal contract lines .....	133
Pounds average load per scheduled trip Jan.-June, 1928, internal contract lines .....	163
Pounds average load per scheduled trip August, 1928, internal contract lines .....	313

### Non-Mail Lines

Operators .....	15
Lines in operation .....	26
Miles of lines operating .....	6,941
Average miles flown daily .....	13,978

### All Airways

Operators .....	35
Airways in operation .....	63
Airways in operation and to operate .....	67
Miles of airways operating 1 or more lines .....	20,788
Revenue of 18 of 21 operators, 1927 .....	\$2,201,150
Expenses of 16 of 21 operators, 1927 .....	\$2,151,340
Investment of 19 of 21 operators, 1927 .....	\$7,053,650
Income of 8 profitable lines, 1927 .....	\$1,340,333
Expenses of 8 profitable lines, 1927 .....	\$956,570
Per cent returns on investment of 8 profitable lines, 1927 .....	28.06
Airplane loss in air transport, 1927 (11 planes) .....	\$97,097
Miles flown by all air transport operators including P. O., 1927 .....	5,809,999
Passengers carried in air transport, 1927 .....	8,572
Average passenger-mile rate of 14 operators, 1927 .....	\$106
Average airplane-mile cost of 15 operators, 1927 .....	\$671
Average airplane-mile cost of 8 operators, 1927 .....	\$545
Average airplane-mile cost of P. O., 1927 .....	\$406
Average airplane-mile cost of 3 operators, 1927 .....	\$209
Average airplane-mile cost, transportation only, of P. O., 1927 .....	\$128
Airplanes in service by 19 of 21 air transport operators, 1927 .....	\$1,838,462
Value of airplanes in service by above .....	107
Pilots employed, December 31, 1927, by transport operators .....	462
Persons total employed, December 31, 1927, by transport operators .....	24,111
Miles of airways operating and to operate .....	53,345
Miles scheduled daily, average .....	

<sup>1</sup>Includes air service operations of transport operators.

<sup>2</sup>476,301 additional miles flown by 9 transport operators in air service, and 297,560 additional miles in ferry and test.

<sup>3</sup>36,918 passengers were carried in air service work by 9 transport operators, and 657 more carried in ferry and test.

<sup>4</sup>It will be recalled that the western half of the Transcontinental was operated by the Post Office until July 1, and the eastern half until September 1, no passengers being carried during that period.

### Aids to Navigation

Miles of airways for night flying, January 31, 1929 .....	7,566
Electric and acetylene beacons .....	1,269
Lighted intermediate beacons .....	220
Radio weather reporting and communication stations .....	28
Miles additional night flying airways scheduled for 1929 .....	2,000
Upper air meteorological stations, mostly at airports (Weather Bureau) .....	46
Cities having airship mooring masts .....	8
Radio-beacons on Transcontinental .....	3

### Miscellaneous

Miles of airways operating on 25th anniversary of flight .....	15,128
Miles of railroads (1850 on 25th anniversary of the railroad) .....	9,021
Air Service operators (estimated) .....	800
Concerns and individuals listed in trade directory (approximately) .....	2,000
Pilots licensed (active) or pending .....	6,608
Student permits issued or pending .....	12,217
Airplane mechanics (active) licensed or pending .....	5,285
Approved models of airplanes .....	113
Approved models of engines .....	21
Aircraft licensed (active) or pending .....	4,191
Aircraft identified (active) or pending .....	2,411
People in trading areas of stops along 63 airways operating, or to operate, in U. S. .....	72,556,818
Station stops on 40 mail airways operating, or to operate (Continental U. S.) .....	105
Miles flown in 1926 by 585 air service operators .....	18,746,640
Miles flown in 1927 by 800 air service operators (estimated) .....	30,000,000
Miles airways in Europe, 1927 .....	36,507
Miles flown European airways, 1927 .....	12,616,752
Airway in Europe, 1927 .....	123
Kilometers flown 1927 by 6 French transport companies .....	6,000,000
Appropriated for Post Office aeronautics 1918-1928 .....	\$22,185,000
Total expenditure by Post Office on air mail 1918-1927 .....	\$18,924,076
Appropriated Agriculture aeronautics 1921-1928 .....	\$253,000
Appropriated for Commerce aeronautics 1927-1929 .....	\$9,775,850
Pounds mail carried by air 1918-Nov. 1, 1927 .....	9,000,000
Miles flown 1920-1928 by one airplane .....	225,000
Aeronautical journals in the United States .....	20
World air records held by United States out of 106 established .....	32
States have no air legislation .....	11
States and territories have the non-regulatory "uniform state law" .....	11
States require examination of pilots and planes; 2 miscellaneous; all territories and possessions, the District of Columbia and Canal Zone controlled by Federal Act .....	18

### Airports

Municipal .....	425
Private and commercial .....	415
Intermediate (Dept. of Commerce) .....	311

## AIRCRAFT PRODUCTION FIGURES FOR 1928

AIRPLANE manufacturing products in the United States for the year 1928 had a total value of \$75,000,000, according to information compiled recently by the Aeronautical Chamber of Commerce of America, Inc., through reports of its members. Approximately 5,000 aircraft and 3,500 airplane engines were constructed; 3,781 aircraft being commercial and 1,219 military, with 2,087 commercial engines and 1,413 military.

Analysis of the commercial aircraft figures for 1928 show the following facts: Biplanes built numbered 2,422 and monoplanes 1,079. Of the biplanes the majority were small open-cockpit types. Monoplanes were chiefly of closed cabin design. There were twelve times as many multi-engined monoplanes built as there were multi-engined biplanes, and, because of this ratio, the total retail value of monoplanes, less engines, was over \$8,500,000 as compared with \$7,500,000 for biplanes. Multi-engined transports account for the value of \$914,000 placed on seaplanes, flying boats, and amphibians.

Reports from 45 airplane companies, which constructed practically the total plane output of the country, show the following numbers of planes of each type produced. Land monoplanes totaled 1,079, there being 171 with open cockpits, 850 of the cabin type, and 58 multi-motored transports. Land biplanes totaled 2,422; open-cockpit planes numbering 2,348, cabin, 69, and multi-motored transports, 5. Seaplanes numbered 5; flying boats 6; and amphibians, 30.

The twelve companies reported as making engines cover the field. They show a commercial production in 1928 of 1,850, having a retail value of \$8,936,725. Production was divided as follows: less than 50 horsepower, 32; 50 to 100 horsepower, 237; 100 to 200 horsepower, 182; 200 to 300 horsepower, 924; above 300 horsepower, 475. The trend at the latter part of the year was toward the very powerful types for transport service and the lighter types for sport or training. Experimentation with heavy-oil burning air-cooled types was notable.

The retail market values of commercial planes and motors built in 1928 was more than \$27,000,000; to which is added \$8,000,000 to \$10,000,000 for the manufacture of spares and for experimental work. Military production and experimentation amounts to \$35,000,000. Altogether 1,219 airplanes were built by nine plants for the Navy Bureau of Aeronautics and the Army Air Corps. Four plants built 1,413 military engines. Diminishing interest in military orders was noted in the closing months of the year.

So far as actual production is concerned, based upon the 53 reports cited, Wichita now leads with 927 planes, which is the total also for the entire State of Kansas. New York State is second with 857 units. In the rank of aircraft manufacturing states, Ohio comes third, showing a production of 816 planes; Missouri fourth, with 736; Colorado fifth, with 341; Illinois sixth, with 248; Michigan seventh with 181 and California eighth, with 140. In estimated gross value of aircraft only. New York was first.



**"You can hit the top with men like that!"**

**The Berliner-Joyce ships, and the entire engineering staff are seasoned by years of outstanding accomplishment.**

**F**IRST, look at the engineering staff:

As Chief Engineer, Frank S. Hubbard (*Mass. Inst. Tech.*) brings a wealth of experience, coming directly from the responsibility of executive head of the Technical Department of Curtiss.

And standing beside him as Chief of Research is William H. Miller (*Univ. Missouri and M.I.T.*) an outstanding aerodynamic expert, designer of the wind tunnels at Massachusetts Institute, lately in charge of Research Laboratory at Curtiss.

#### DESIGN AND CONSTRUCTION

William Wait, Jr. is best known as the design engineer on the most successful Curtiss models, including the Schneider Cup and Pulitzer Trophy racers. Then he went to Chance-Vought and now is Berliner-Joyce Chief of Design.

Earl P. Osborn (*Rensselaer Polytechnic*) is in charge of Structures. He was in charge of the propeller department at Curtiss, later made head of Curtiss Structural section.

As factory superintendent, Thos E. Pell (*Lehigh Univ.*) brings a wealth of experience, from the same responsibility with the Naval Aircraft Factory at Philadelphia.

#### BACK OF IT—

Henry Berliner (*Mass. Inst. Tech.*) was the designer and builder of the Berliner helicopter and monoplane, and president of the absorbed Berliner Aircraft Company. He becomes *Vice-President* of Berliner-Joyce in charge of Production.

Temple N. Joyce (*Balto. Poly. and Lehigh Univ.*) is internationally known as test pilot for the Army during the war, testing practically every type of plane constructed by the Allied and Central Powers. Later Washington representative of the Curtiss Company, and then sales manager for Chance-Vought. He is *Vice-President* in charge of Sales.

Gathering this truly unusual technical and manufacturing staff together, stands W.W. Moss, formerly *Vice-President* and Controller of Curtiss, who is *President* of the new Corporation.

#### THE FUTURE

What do you expect of such an experienced and balanced staff as this? The B-J ships now in design promise to set new standards in aviation.

## BERLINER-JOYCE AIRCRAFT CORPORATION

Offices

HEARST TOWER BUILDING  
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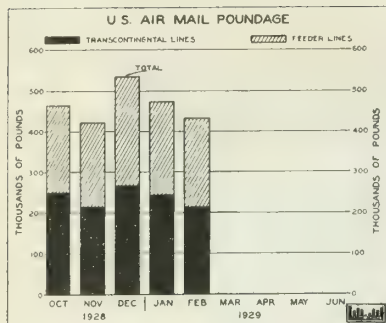


Factory

ALEXANDRIA, VIRGINIA

*New Quarter-Million dollar plant now building at Baltimore*





Air mail poundage; October, 1928-February, 1929 (inclusive).

## WHO USES AIR MAIL

AFTER surveying the use of air mail and express routes by business concerns located on air routes, the aeronautical committee of the Chamber of Commerce of the United States reports that 96 per cent of the firms use the air service.

The survey revealed that the air mail saves bankers from one to three days interest by sending items to New York City by air rather than by the Federal Reserve system, amounting to savings of eight cents per day per thousand dollars. Saving reported by banks ranged from \$125 to \$5,000 per month. The banks use the air mails for sending checks, drafts and notes for collection and credit advices of payment of drafts, etc.

Insurance companies find the air service profitable not only in the benefits of gaining good will by prompt attention, and the ability to settle losses more quickly, but also in the faster delivery of court documents, stolen car identification papers, and other matter which could not be sent by wire due to cost, form and nature of contents. They use the air services for the following articles principally: letters, applications, policy contracts, proofs of loss, daily reports, etc.

Business houses indicated savings in time of delivery of correspondence and urgent supplies. They use the air service for contract and credit letters, documents and sales promotion materials, advertising copy, etc.

## A DANGEROUS CARGO

BY DILLON SULLIVAN

TWO hundred quarts of sudden death in the shape of nitroglycerin were successfully transported from Shelby, heart of the Kevin Sunburst oil field, to Calgary, Alberta, (an airline distance of 250 miles) by Capt. F. R. McCall, D. S. O. M. and F. C., flying a Stinson-Detroiter. The entire amount was carried in two trips made in the latter part of February. As far as oil men and fliers here can learn, this was the first time that a plane has been called upon to transport such a dangerous and highly combustible cargo.

The Great Western Airways of Calgary was called upon when a Canadian oil company drilled in a well near Calgary and then could not get nitro through from Shelby because of the snow blocked roads.

Trains are not allowed to handle the nitro

because of the danger. It is usually carried from the magazine to the well in a specially prepared truck called the "death wagon," which has special springs and a "cradle" to keep the nitro torpedoes from the slightest jar. The saying in the oil fields is that "a feather dropping is enough to explode nitro."

At Shelby, just before Captain McCall took off with the first one hundred quarts, the townspeople gathered to watch, keeping about a mile distant from the plane and waiting expectantly.

Just a few months ago the nitro man had left Shelby and gone to the magazine with his truck. Something happened, and all that was found of the truck or the nitro man was a hole in the ground and a few pieces of iron.

Charles Stalamaker, torpedoman who succeeded the one who was killed, made the trips with Captain McCall. When he and the captain entered the plane, the expectantly awaiting townspeople moved back, but Captain McCall, who during the war downed several German planes, took the Stinson off easily and disappeared in the direction of Canada. He landed at Calgary all right—nor was he bothered by crowds flocking about the plane there. After the nitro was unloaded from the plane, a mechanic attempted to taxi it into the hangar but the prop stopped and investigation showed that the plane was out of gas.

### Canada-to-Cuba Non-Stop

CAPT. GEORGE M. HALDEMAN, in a standard Bellanca CH monoplane, made the first non-stop flight from Canada to Cuba on February 23. Capt. Haldeman on the flight carried 252 gallons of gasoline, part of which was carried in five-gallon tins in the cabin and pumped into the fuel tanks with a hand pump. He took off from Walkerville, Canada, at 3:49 a.m., and, directing a straight course over Cincinnati, Atlanta, and Tampa, arrived at Havana in 12 hours, 56 minutes, having traveled 1,404 miles. Mechanic James Hayden accompanied him.

## WRIGHT ENGINE SERVICE STATIONS

WITH the establishment of thirty-six service stations and depots for the Wright Whirlwind and Cyclone engines throughout the United States, the Wright Aeronautical Corporation has announced plans for a chain of over one hundred similar service stations joining every part of the country. Representatives in five foreign nations have been appointed.

The aim of the chain of depots and service stations, according to Bruce G. Leighton, director of sales and service for the Wright company, is to have a complete plant for the care of Whirlwind and Cyclone engines within the reach of every owner. The service stations and depots already established include Air Associates, Inc., Curtiss Field, N. Y.; H. C. Barru, Mexico City, Mexico; East Coast Aircraft Sales Corporation, Boston; Ludington Flying Service, Philadelphia; Pacific Aeromotive Corp., Los Angeles; Robertson Aircraft Corp., St. Louis; Servair, Inc., Pittsburgh; Stout Air Services, Detroit; Watkins Manufacturing Co., Wichita, Kansas; Thompson Aeronautical Corp., Cleveland; Braniff, Inc., Oklahoma City; Bredow-Hilliard Co., Kansas City; Embry-Riddle Co., Cincinnati; Flyers, Inc., Albany, N. Y.; General Aviation Co., Syracuse; Jack Byrne, Inc., Grand Rapids; Johnson Flying Service, Dayton, O.; Midwest Airways, Inc., Milwaukee; Pitcairn Aviation Co., Richmond, Va.; Wright Aeronautical Corp., service division, Paterson, N. J.; Robert Fogg, Concord, N. H.; Pacific Aeromotive Corp., Oakland, Cal.; Van Nuys Airport, Los Angeles; Thompson Aeronautical Corp., Bay City and Kalamazoo, Mich.; Wright and Eisenwein, Buffalo; and the Texas Aeromotive Corp., at the following points: Big Spring, Brownsville, Dallas, El Paso, Houston, San Antonio, Texas; Texarkana, Ark.; Birmingham, Mobile, Ala.; New Orleans, La., and Atlanta, Ga.

Foreign licenses have also been granted.



Loading nitroglycerin in the Stinson-Detroiter biplane at Shelby, Montana.

ANOTHER ONE OF THE 65 AIRCRAFT MANUFACTURERS  
THAT USES **SKF** BEARINGS

## Wright Aeronautical Corporation



YOU MAY BUY A  
BEARING AS A  
BARGAIN BUT  
TRY AND GET A  
BARGAIN OUT OF  
USING IT

*for*  
Nothing is apt to cost so much  
as a bearing that cost so little



## Leaders in Aviation Use **SKF** Because Reliability is Not Sacrificed to Price

**T**HROUGHOUT the aviation industry there is one reason and one only why **SKF** Ball and Roller Bearings are first choice of the leaders, the immutable truth that....in the air certainly nothing is apt to cost so much as a bearing that cost so little! And so this huge transport plane is equipped with three Wright Whirlwind motors with **SKF** Bearings on the vital locations.

Much has been said and written of precision, quality, long life and dependability of anti-friction

bearings. **SKF** makes no broad claims to these virtues but bases its leadership in aviation on proven performance on epoch-making flights and commercial service. **SKF** controls the production of its bearings from the ore to the finished product. **SKF** does not manufacture one type of bearing. It makes many types. Therefore, **SKF** recommendations are—unbiased. Wright has been using them for 15 years and 64 leaders in the industry also incorporate them in their products.

**SKF** INDUSTRIES, INC., 40 East 34th Street, New York, N. Y.

See the  
**SKF** EXHIBIT  
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ALL-AMERICAN AIRCRAFT  
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# SKF

# Ball and Roller Bearings



## WASHINGTON, D. C. NEWS

By WING OVER

THE aeronautics industry of the country owes the District of Columbia an unanimous vote of thanks; for is this not the only city of over half million population which is not planning an aircraft show? Perhaps the lack of a suitable building, and possibly the fact that we are ashamed of our airports (or absence of an airport which could be dignified by that term) explains why there is to be no indoor airplane exhibition at the seat of the Government. This writer has harped so much on the inadequacy of landing facilities near Capitol Hill that he will cease further comment except to state that ducks landed on Bolling Field during the month.

Sixty-six and two-thirds per cent of the air cabinet has been appointed, namely Assistant Secretary of War Trubee Davison, to succeed himself, and Assistant Secretary of the Navy, D. S. Ingalls to succeed Edward P. Warner. By the time this appears in print, the appointment of an equally well chosen Assistant Secretary of Commerce for air will probably have been announced. Rumor has it that Major Clarence Young, now touring Europe in his Stearman, will be the appointee. There cannot be many better men to fill the big gap left by the resignation of Wm. P. MacCracken, Jr. No matter who is appointed, the President can be counted on to fill the important Commerce post satisfactorily, if his reappointment of Admiral Moffett as Chief of the Naval Bureau of Aeronautics can be taken as a criterion.

WE have had a taste of the international variety with the training of Mexican air service pilots at the Anacostia Naval Air Station. Lieutenants Azcarate and Torres and Colonel Rojas have already completed their refresher courses and six more trainees are expected. The training was in Vought Corsairs of the type recently purchased by their government. An interesting side light is that all the pilots of the Mexican air service were asked to submit written recommendations as to the planes they would like to fly. Whether Voughts were bought because of, or in spite of, the consensus of opinion is unknown. It was stated at the air station that the Mexicans were, all in all, fairly good pilots and showed evidence of satisfactory training.

THE Navy, as well as the Marine Corps, has its stars who are forced to hold down desk jobs. Captain Majors (who should soon be Major Majors) of the Marine Corps is Chief of the Information Division of the Bureau of Aeronautics. Any one who has had contact with him knows that he gives service. In addition, he was recently recommended by Admiral Moffett as pilot for a long distance flight now pending. Capt. Holden Richardson (CC), holder of a very early aviator's certificate and internationally recognized seaplane designer, will be missed at the Navy Department. The Great Lakes Aircraft Cor-

poration of Cleveland is fortunate to have hooked the Captain so shortly after his retirement.

LIEUT. LESTER MAITLAND, of Oakland-Honolulu flight fame, has been testing out Assistant War Secretary Davison's Curtiss Falcon at Bolling. This flying office is the Army's equivalent to the Vought fitted up for the special use of Admiral Moffett. Lieut. Maitland has been holding down a desk in the War Department as one of the assistants to the Assistant Secretary. Capt. Ira Eaker, until recently, sat at the desk alongside Maitland.

## Christopher Secretary of N.A.A. Contest Committee

LUKE CHRISTOPHER was recently appointed secretary of the contest committee of the National Aeronautic Association. As secretary of this committee, of which Orville Wright is chairman, Mr. Christopher will have supervision over all aircraft contests and world record trials in the United States. Carl F. Schory, formerly secretary, resigned to enter commercial aviation.

JAMES WARD PACKARD, the automobile manufacturer, loved and collected fine watches. Accordingly, since his death, his collection of fine timepieces has gone to Horological Institute of America at Washington. The Horological Institute is the organ of the Government for the development of minutely accurate timepieces—those delicate mechanisms which have played so large a part in the furthering of aviation.

ON March 3 Capt. Albert W. Stevens took aerial flashlight pictures of the Capitol and the White House when they were decorated for the inauguration. Twenty-five-pound magnesium bombs were used to supply the flash.

Capt. Stevens used a standard O2 observation plane, equipped for night flying and photographic work, with long exhaust stacks to eliminate exhaust flare. An Army K-3 camera was used. After being developed on the plane, the pictures were dropped to ground officers who took them to be telegraphed throughout the nation.

ONLY American owned and operated aircraft will be allowed to carry on commercial aviation in the Panama Canal Zone, according to regulations recently issued by the Department of State. According to the announcement all private planes, which are given permission to operate in the canal area, must be available to the U. S. military forces in time of emergency. The order includes specific regulations for all aeronautical activities in the Canal Zone.

COL. CHARLES A. LINDBERGH has been appointed technical advisor to the Aeronautics Branch of the Department of Commerce. While holding no regular position with salary attached, he will be available when needed by the Department for advice on airway regulation, accident pre-

vention, airport construction, airway equipment, mapping and aeronautical research.

## FLYING CROSS TO WRIGHT BROTHERS

THE former Secretary of War, Honorable Dwight F. Davis, formally presented the D. F. C., awarded by Act of Congress approved December 18, 1928, to Mr. Orville Wright and, posthumously, to his brother, Mr. Wilbur Wright, on February 27.

CONFORMITY of state regulations with the Federal law requiring the inspection and licensing of all aircraft and pilots is the purpose of the Department of Commerce report recently circularized among local chambers of commerce throughout the country. The proposed action would require all aircraft and pilots engaged in commercial activities to carry Federal licenses.

CROSS licensing will give the Government the right to use more than 300 airplane patents, according to a contract signed recently with the Manufacturers Aircraft Association. The new contract, which modifies the old cross license agreement, provides for a two per cent royalty. During the twelve years the old contract was in operation, 17,000 airplanes were made under it. F. H. Russell and Chance Vought were the signing officers of the manufacturers association.

## Radio Beacon Experiments

BENDING the course of a directive radio beacon at Bellefonte, Pa., has made it possible to serve Brookville and Numidia, Pa., simultaneously. The bending of the radio course to serve three towns not in a straight line is the result of experiments made by the Bureau of Standards in co-operation with the Bureau of Lighthouses.

REGULATIONS covering the construction and protection of airports drawn up by the National Board of Fire Underwriters were discussed at a conference of the board with representatives of the aeronautical industry at Washington on March 22. The regulations were drawn up to establish a policy for the prevention of airport fire hazards.

## WEST VIRGINIA NEWS

## New Fokker Factory

EIGHTY-FOOT doors to accommodate the wings of the Fokker F-10A have been constructed in the first unit of the new factory of the Fokker Aircraft Corporation at Glendale, West Va. Plans call for 150-foot doors in later units to handle larger planes.

The present unit of the factory, which was put into operation recently, is of brick and steel construction, 200 feet by 400 feet. It is divided into two sections, one for manufacture, and one for assembly. The work of the new plant will supplement the production of the company's factory at Haskins Heights, N. J.



## Don't miss it!

DON'T miss Spalding's booth at the International Aircraft Show in the Exposition Hall at Detroit, April 6 to 13.

Here you'll see the greatest variety of aviation equipment ever exhibited at an aircraft show. Suits, boots, goggles, gloves, helmets, jackets, etc., etc., and et cetera.

Remember—there've been as many developments in equipment as there've been in engines or planes.

Remember—you'll see these up-to-the-minute developments at Spalding's booth.

Don't miss it!

*A. G. Spalding & Bros.*

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AVIATION EQUIPMENT



## NEW YORK AIR NEWS

**T**HREE new directors were recently added to the board of Air Investors, Inc. They are William Stout, president of Stout Airways and of the Stout Metal Airplane Co.; Seymour Knox, first vice president of the Marine Trust Co., Buffalo, and president of the Marine Union Co.; and W. W. Crocker, vice president of the Crocker First National Bank, San Francisco.

### Associated Aviation Underwriters

**S**IXTEEN old-line insurance companies, with combined assets of one-third of a billion dollars, have organized the Associated Aviation Underwriters. The new company will write all classes of airplane risks, including fire, accident, tornado, theft, property damage, public liability, passenger liability, personal accident, and workmen's compensation.

The companies participating in the new organization are: the Continental, Fidelity-Phenix, American Eagle, American of Newark, Fireman's, Glens Falls Insurance, Hanover, Glens Falls Indemnity, Federal, Sea Insurance, Marine Insurance, London Assurance, Alliance Assurance, Merchants Fire of N. Y., United States Guarantee, and the Merchants Indemnity.

The managers of Associated Aviation Underwriters will be J. Russell Parsons of Chubb & Son; Owen C. Torrey of the Marine Office of America; and Alvin W. Smith, formerly of the Aeronautics Branch of the Department of Commerce.

**T**HE General Aeronautics College, organized and put into operation recently by the General Aviation Co., at the Syracuse airport, gives students the choice of open planes or heated cabin planes for their flying instruction. This school gives full courses of instruction for private, limited commercial, and transport licenses. Bi-weekly ground school classes are held for instruction in the theory of flight.

**T**O stimulate students to give more serious consideration to the problems facing the aeronautical industry, the American Society of Mechanical Engineers is offering the Black & Bigelow Aeronautic Prizes for the best papers on civil aeronautical subjects. Those submitting papers must be student associates of the A. S. M. E.

The papers must be submitted to the board

of awards not later than June 30th of each year. The papers may be on any civil aeronautical problem, and may be historical, analytical, experimental, or practical in nature. The members of the board of awards are: Col. V. E. Clark, T. H. Bane, C. B. Harper, and Col. C. de F. Chandler, secretary.

### Inter-Allied Aeronautics

**I**NTER-ALLIED AERONAUTICS, INC., a five million dollar holding corporation, has been organized to finance aeronautical development, according to Col. George R. Shanton, president. The firm plans to establish several large airlines, to finance the execution of aircraft manufacturing contracts, to finance purchases for airlines and airports, and to participate in the underwriting of aircraft securities.

Among the directors of the new concern are: William B. Stout, Brig-Gen. Milton F. Davis, Alexander Klemm, Walter McKay Jones, Peter J. Brady, and Frederick S. Stoepel.

**O**FFICIAL government approval was recently given to the Bristol Jupiter geared airplane engine. The Jupiter, a nine-cylinder radial air-cooled power plant, received an official rating of 500 horsepower at 2,000 revolutions per minute. This engine is being manufactured in this country by the E. W. Bliss Co.

**A**IRCRAFT CONTROL CORPORATION of Philadelphia, a company active in the designing and manufacturing of apparatus for the automatic steering and control of aircraft, was acquired recently by the Consolidated Instrument Company of America, Inc. The Aircraft Control Corporation manufactures many of the aircraft instruments used by the military branches of the Government air services. Among the major aviation instruments developed and produced by the Philadelphia firm are air speed meters, drift indicators, fuel level gauges, fuel flow meters, compasses, tachometers, gust indicators, and supercharger gauges.

**N**EW officers of the Sunrise Flying Club of Rockville Center, L. I., are Bert Shields, president; Milton Simon, vice president; John Linton, treasurer; Bruce Smith, executive secretary; John Remmert, financial secretary; and Elsa Campbell Ferguson, corresponding secretary.

### The Aviation Corporation

**W**ITH plans for initial financing at thirty-five million dollars, the Aviation Corporation was organized recently as a holding and development company. The concern will supply technical and managerial coöperation to its subsidiary organizations, and will hold financial resources for their support greater than a single unit would be able to command. Lehman Brothers and W. A. Harriman, Inc., of New York City are active in the organization and management of the new holding corporation.

The resources of the Aviation Corporation will consist largely of the majority of stocks of other companies, and it may secure interests in concerns not controlled. It is at present negotiating for interests in several established companies in the field representing various phases of the industry.

The board of directors of the Aviation Corporation includes many railroad and steamship executives. The officers of the corporation are W. A. Harriman as chairman of the board of directors, Graham B. Grosvenor as president, Robert Lehman as chairman of the executive committee, and George R. Hann as vice chairman of the executive committee. Officials of transportation companies who are to be members of the board of the new corporation are: L. W. Baldwin, Matthew C. Brush, R. Stanley Dollar, Edward P. Farley, John M. Franklin, John L. Lancaster, J. S. Pyeatt, C. B. Seger. The other directors, in addition to the officers of the company, will include Frank Andrews, Harold O. Barker, William G. Beckers, C. K. Boettcher, D. K. E. Bruce, Rogers Caldwell, Frederic G. Coburn, W. W. Crocker, John W. Cutler, Sherman M. Fairchild, John C. Grier, Jr., Stanley J. Halle, John W. Hanes, George M. Holley, A. L. Humphrey, James M. Hutton, Jr., W. F. Kenny, Robert Law, William Dewey Loucks, Alan J. Lowrey, C. Townsend Ludington, Paul M. Mazur, George Mixer, Harry S. New, Maurice Newton, Edward J. Noble, Roland Palmedo, Charles M. Parker, Major General Mason Patrick, Harry C. Piper, Joseph W. Powell, Frederick S. Pratt, Samuel F. Pryor, George M. Pynchon, Jr., Edwin B. Reeser, James A. Richardson, Alexander B. Royce, William B. Scarborough, John D. Siddeley, C.B.E., Sidney W. Souers, Eugene W. Stetson, G. H. Walker, Harvey L. Williams, and Robert W. Woodruff, who is president of the Coca-Cola Company.



An unusual event in the New York area: A Fairchild 71 taking off at Farmingdale, L. I., for delivery in Canada.

# Win Your Wings In Sunny Texas

**The Government Has Chosen Texas—With Its Bright Skies—Many Sunny Days—Open Landscapes—As Its Aviation Training Ground—And So Can You!**

By great strides Aviation sweeps on to its place as the greatest of modern industries. The next six months will see such flying activity—in every nook and corner of the land—as never has been dreamed of until now. The sky's open pathway is one vast Opportunity, far bigger than present production of ships—ports—and trained men and women can take care of. The burning question for YOU is—

**Not "Can I Find a Place?" but  
"How Quickly and How Well Can I Train?"**

The straightest road to flying success lies through the fair, flat fields and bright skies of Texas—America's chosen training-ground since the very birth of Aviation. Here you will not run into long, discouraging delays from unfit weather. Your air problems are worked out smoothly, day after day, in smiling skies above the sun-lit plains.

To Nature's splendid advantages this school adds everything that ample capital and wide experience can provide. Under the leadership of Captain Long we have assembled a faculty of pilot-instructors unsurpassed in America for experience in flying and skill in teaching. They will be your leaders—your friends—your loyal co-workers from the day you enter the School until the day you emerge, an able licensed pilot.

Captain Long himself, one of the best known and most widely experienced figures in aviation, will supervise every stage of your training.

**None but the Newest  
Ships and Motors**

In order to maintain our reputation as one of the best-equipped flying schools in the country we keep every piece of equipment in perfect condition at all times, with rigid daily inspections and frequent replacements.

You will fly in new ships, with new motors, under the guidance of instructors that have been picked from the very front rank of the air's ablest pilots.

**Varied Courses of Training**

We prepare you for any position in aviation—transport or private pilot, factory connection, airplane distributor or

salesman, airport official or aviation mechanic. Students are here from nearly every State, and from Mexico, Canada and Hawaii.

**We will help you locate**

The prominence and high standing of Dallas Aviation School and Captain Long among airplane manufacturers and pilots all over America assure you of a wide scope of opportunities upon graduation. There's no limit to what you can accomplish in this vast new industry save the limits of your own ability, and we take a close personal interest in every student's future.

**You can earn as you learn**

The school is on the outskirts of Dallas, a city of 290,000 where employment can be secured for part time, and the School courses can be arranged to suit. To those who desire social activity Dallas people are receptive and cordial.

**How you Save**

Charges for tuition at Dallas Aviation School are the same as at other best-grade schools, but the rapidity of your training and the time you will save mean a saving of one-third or more of your training-period expense, beside putting you into a paying position while others are still in training.

Excellent living accommodations are available adjoining the school at extremely moderate costs, or you may live wherever you like. You will find no lack of congenial companions and you will have opportunities to meet many well-known flyers.

Clip and mail the coupon below for complete details—then you'll come to Dallas Aviation School.

**Fortunes In the Skies! Let Us Help You Rise**

Gentlemen: Please Send Me Complete Information.

Name .....

Address .....

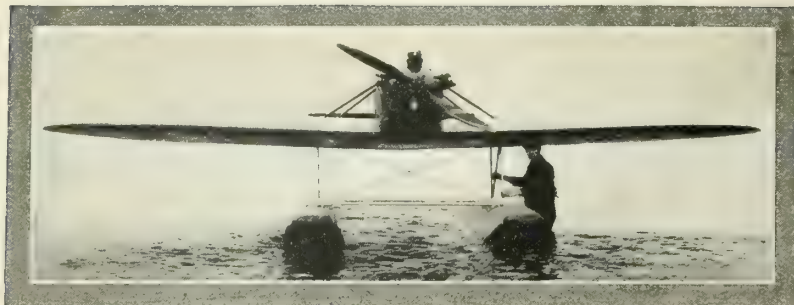
Dept. 1.

# DALLAS AVIATION SCHOOL

**Captain W. F. Long, President**

**DALLAS, TEXAS**





Fairchild 21 low-wing monoplane equipped with Edo floats.

#### Publishers' Section, Aeronautical Chamber of Commerce

**F**RANK TICHENOR of *AERO DIGEST* and Earl Osborn of *Aviation* were elected Chairman and Vice-Chairman respectively of a general committee formed by the Publishers' Section of the Aeronautical Chamber of Commerce to investigate questionable aeronautical advertising at a meeting held here recently.

A sub-committee on investigation, with the following members, was appointed: Ralph Duysters, *Airway Age*, chairman; Harley W. Mitchell, *Aeronautics*, vice-chairman for the Middle West; Robert J. Pritchard, *Western Flying*, vice-chairman for the Pacific Coast; L. A. Nixon, *Air Transportation*, and Harry Schwarzschild, *Airports*, members-at-large.

The members of the committee pointed out that the formation of the questionable advertising committee was a preventive rather than a corrective measure and stressed the importance to the development of the industry in having a medium through which advertising appearing doubtful as to facts could be checked. Coöperation on the part of advertising managers and advertising agencies will be sought.

**T**WO acetylene producing plants at Phoenix, Arizona, and El Paso, Texas, were among the properties acquired by the Prest-O-Lite Co., Inc., recently in purchasing the Acetylene Products Co. The new units are operating in the Prest-O-Lite chain of thirty-eight plants throughout the country producing dissolved acetylene for welding and cutting.

**C**ONTRACTS for airplane instruments have been closed by the Consolidated Instrument Company of America, Inc., with the Advance Aircraft Co., Alexander Industries, Inc., Consolidated Aircraft Corp., Fairchild Aviation Corp., Lincoln Aircraft Co., General Airplanes Corp., and Nicholas-Beazley Co.

**L**EGAL and legislative research has been arranged for by the Aeronautical Chamber of Commerce of America in the formation of a special committee under the leadership of H. J. Freeman, of the faculty of New York University Law School. The work of the committee, which will be available to members of the Chamber, will consist of compiling and interpreting decisions affecting aviation, circularizing such decisions

of importance, securing immediate information on legislation introduced into Congress or state legislatures, and, where such contemplated legislation is of vital concern, informing members of the Chamber of the legislation and its significance.

**C**HARLES EDISON, son of Thomas A. Edison, is the new president of the Splittorf-Bethlehem Electrical Co., and the Splittorf Electrical Co.

**C**URTISS FLYING SERVICE, INC., will henceforth handle all sales of the Cessna monoplane in the United States and Canada, as a result of recent negotiations between the Service and the Cessna Aircraft Co., of Wichita, Kansas. The Cessna plane will be distributed through the twenty-five airports and airfields of the Curtiss Flying Service throughout the country. L. B. Cooper, Curtiss motor and plane sales manager, will have charge of sales and distribution of the Cessna planes.

#### Air Associates Expansion Program

**A**IR ASSOCIATES, INC., has begun an expansion program of half a million dollars following a recent directors' meeting, according to Haven B. Page, treasurer of the corporation. The plans call for the immediate erection of service plants on the Chicago and Newark municipal airports, designed after the firm's present station at Curtiss Field, Long Island. These plants will be equipped with machine shops, stock repair rooms, retail stores, and storage facilities.

The officers of Air Associates, Inc., are: James B. Taylor, Jr., president; F. Leroy Hill, vice president; Haven B. Page, secretary-treasurer. The directors, other than the officers, include: Gilbert Colgate, Jr., Charles L. Lawrance, Roland Palmedo, George B. Post, George M. Pynchon, Jr., Louis W. Stotesbury, Chance Vought and Harvey L. Williams.

**A**N aircraft beacon receiver of Radio Frequency Laboratories, Inc., an air beacon newly developed by the Bureau of Lighthouses, Department of Commerce, a display of chromium plating and its uses of United Chromium, Inc., and samples of nitralloy, widia, and chrome nickel alloy, were among the displays of aeronautical interest at the American Institute of Science dinner given recently in the Hotel Astor, New York City.

**S**IX light Blackburn Bluebird all-metal sea-planes, according to an announcement by Lady Mary Heath, have been ordered from the Blackburn Aeroplane and Motor Co., Ltd., of Yorkshire, England, by A. R. Martine of New York. These planes are constructed of steel plates riveted together, and are powered with Cirrus Mark III engines. These will be the first of this type brought to this country.

**A**ERIAL ACTIVITIES, INC., an aviation company to serve as representative of all aviation activities with which Lady Heath is affiliated, was recently organized. The firm will handle the rights she holds for foreign planes. The officers are: Lady Mary Heath, president; Arthur von Briesen Menken, vice-president, and Gertrude M. Schreiber, secretary and treasurer.

**C**IRCLING his mail plane low over a smoking building while he raced his motor, Merle A. Moltrup, air mail pilot of the Colonial Western Airways, Inc., recently attracted the attention of Silver Creek, N. Y., inhabitants to the fire, and saved the lives of two children. Mr. Moltrup was afterwards praised for his act by the Chamber of Commerce of Silver Creek.

**C**OLONIAL AIRWAYS SYSTEM, INC., reported that during February its planes flew 44,490 miles in 510 hours, carrying 21,387 pounds of mail. This was divided among its three branches: Colonial Air Transport, operating between Boston and New York, flew 8,370 miles in 102 hours, and carried 4,459 pounds of mail. Colonial Western Airways transported 6,643 pounds of mail between Albany and Cleveland over 21,855 miles in 260 hours. Canadian Colonial Airways, flying between New York and Montreal, covered 14,265 miles in 147 hours, with 10,285 pounds of mail.

**F**EATURING colored helmets for women fliers, A. G. Spaulding & Bros., sport and aviation equipment goods manufacturer, has added to its line of aviation wearing apparel. A new suit with an outer and an inner leather shell, with a lining of fleece between, and a short-fingered gauntlet glove, designed to give the warmth of a mitten, are also made to add to flying comfort.

**O**RDERs for navigational instrument equipment to conform to the new standards adopted by the joint Army and Navy Standards Conference held in Philadelphia recently are announced by the Consolidated Instrument Company of America, Inc., from the Mahoney-Ryan Aircraft Corporation of St. Louis, and the Stearman Aircraft Company of Wichita, Kansas.

**J**ULIEN P. FRIEZ & SONS, the research and manufacturing division of the Consolidated Instrument Company of America, Inc., will supply and engineer all equipment for Transcontinental Air Transport meteorological stations to be put in operation this summer.

LIGHT WILL PUT YOUR AIRPORT ON THE NIGHT MAP OF AMERICA



# BOISE

awaits your arrival  
day and night

ON Contract Air Mail Route No. 5, the Boise municipal airport stands ready for service—day and night. There is a rotating beacon. The field boundaries and obstructions are properly marked. And the entire field surface is remarkably well lighted with a single G-E airport twin floodlight.

Every essential to daylight safety is provided for night landings.

Investigate the many exclusive features of G-E equipment and let G-E lighting specialists submit their recommendations for the solution of your problems. There is no obligation.



For ten years, General Electric has manufactured equipment specially designed for airport and airway lighting. In fact, a majority of the equipment in use to-day bears the G-E monogram. Look for this emblem also on incandescent MAZDA lamps, transformers, control equipment, and cable.



711-29

# GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY N. Y., SALES OFFICES IN PRINCIPAL CITIES



### Plane Service for United States Lines

**B**OAT-PLANE service from the Atlantic ports to western cities is planned by P. W. Chapman, New York and Chicago banker, who recently purchased the *Leviathan* and ten other ships of the United States Lines. The twin-motored, all-metal twenty-passenger monoplane recently designed by Vincent Burnelli will be used. The plane is now undergoing tests at the Anacostia Naval air station.

**A** MOHAWK PINTO two-place monoplane was displayed in the lobby of Hotel Pennsylvania in New York City from March 16 to 31 by the Seaboard Aircraft Corporation.

**A** DIVIDEND on all preferred stock of Air Associates, Inc., was declared recently by the board of directors of that concern.

**E**XPORT orders amounting to \$314,000 were received by the Fairchild Airplane Manufacturing Co., during the first two months of this year, according to figures made public by G. B. Grosvenor, president. Of the 18 planes ordered, 13 have already been delivered.

These orders, all for high-wing cabin monoplanes, came from Canada, Mexico, Central and South America. Four were for the Whirlwind-powered FC-2, four were for the FC-2W2 with Wasp engines, and ten for the Wasp-engined 71.

**C**APT. CHARLES SUTTON of the Dominion Explorers has started north for the summer's prospecting work at his base on Tavane Bay on Hudson Bay, 1200 miles north of Winnipeg, in his Fairchild cabin monoplane. He is accompanied on the trip by his wife and A. J. Milne, chief mechanic for the prospecting organization.

His plane, which is one of five Fairchilds to be used by the exploring group, seats five persons, and is powered by a Pratt and Whitney 410 horsepower engine.

### ALBANY AIR NEWS

By H. F. Wood

**T**HREE Sikorsky amphibians will be assigned early this summer by Canadian Colonial Airways to the New York, Albany and Montreal air mail and passenger service, according to announcement by Capt. Hale Francisco, chief pilot.

Landings probably will be made at 79th Street in New York City, at the Yacht Club pier in Albany and at the bridge over the St. Lawrence at Montreal. Another stop may be added at Lake George for the convenience of New Yorkers who spend their summers there.

**G**EORGE E. WALKER, president of the Albany Air Service, has announced plans for a passenger service to Lake George and Saratoga this summer. The former will be run on a bi-weekly schedule and the latter a daily schedule during the racing season in August.

This company recently took the agency for Moth planes and is planning to add several to its present equipment for hopping and instruction work.

**F**LYERS, INC., have opened a downtown office in Eagle Street, the heart of the Albany business district. A classroom, fitted up for the winter ground school, is being conducted under the supervision of A. R. Mabry.

**T**HE hangar and passenger terminal being constructed by Colonial Airways at the Albany airport is now nearing completion. It is expected the building will be ready for occupancy by May 1st.

**A**PPOINTMENT of Peter J. Brady and John Dwight Sullivan, both of New York City, to the state aviation commission has been announced by Governor Franklin D. Roosevelt.

**O**FFICIALS of Coastal Airways, Inc., which is to begin a New York-Montreal passenger service June 1, are considering Troy as an intermediate stop. Ezio De Angelis, chairman of the concern, recently conferred with Edgar H. Buck, manager of the Troy airport, and it is expected an agreement will be reached within a short time.

**L**IEUT. JOHN G. DEATOR and Lieut. James L. Payton have joined the piloting staff of Canadian Colonial Airways, Inc. Frank J. Ambrose, former Canadian Colonial pilot, is now operations manager for the Curtiss Flying Service.

### CENTRAL NEW YORK

By Mildred Marvin

**T**HE Empire Air Transport, Inc., recently organized to operate an air service and training school on a flying field adjacent to the Syracuse-Amboy municipal airport, has purchased 15 New Standard sesqui-planes. The purchase represents an outlay of \$126,000.

Emil Roth, Jr., is vice president and general manager of the new service organization.

Land, across the road from the Amboy-Syracuse municipal airport, known as the Ward property, has been purchased, and a \$40,000 hangar will be erected on it. The hangar will be 120 by 100 feet in size, with classrooms, machine shops and space for housing the planes.

Four competent pilots will be engaged to instruct flying pupils and to pilot planes for transportation. Ernest Hannum already has been signed up to act as pilot and instructor. The corporation will get under way about May 15 with complete service in all branches of flying, instruction, cross-country transportation, short hops, and aerial photography.

**T**HE organization of an aviation club at Syracuse University was completed recently. Officers were selected at a meeting at the Kappa Sigma fraternity house. Wesley Texill was elected president of the club;

Barbara Hoyt, vice president; Eleanor Lay, secretary; Lee Miller, treasurer; Catherine Ruland, publicity director; and Stuart Jones, representative to the General Aviation Company.

The plan of the organization is to purchase a plane, pay dues for its upkeep and operating expense, and hire an instructor.

**A**NOTHER aviation club was organized recently at a meeting held in the new offices of the General Aviation Company in Hotel Syracuse. A committee was appointed to draw up tentative by-laws and attend to other details of the organization. The committee consists of L. J. Farley, chairman; W. J. Knight, Herbert Ross and Chedell F. Hiser. The organization plans to follow about the same plans as the university students.

**E**DWARD J. (Red) DEVEREAUX has been appointed operations manager for the Central New York branch of the Curtiss Flying Service, Inc.

**C**HRISTY MATHEWSON and a partner have inaugurated a plane service for the various resorts around Saranac Lake, N. Y., in the Adirondacks.

### Binghamton Notes

By John B. G. Babcock

**T**HE Binghamton Aero Club, which was formed two years ago, but which has been dormant during the last nine months, has been revived and has obtained about 25 new members through merger with the Binghamton Flyers Club. The latter organization, composed of young men who wish to become pilots, was formed recently.

Aero Club officers for the ensuing year were elected March 5 as follows: president, Lieut. Bruce Johnson; vice presidents, Richard L. Bennett, Richard S. Lusk and Fred Thomas; secretary, J. Herman Crowley; treasurer, Charles Maricle; board of governors, John L. O'Neil, Major Floyd D. McClean, Capt. Harold S. Tolley, Irwin Sirowatka and Harry L. Hubbard.

The club adopted a resolution March 6, authorizing its officers to offer the organization's full cooperation to the city administration in all matters pertaining to aviation.

The Aero Club and Flyers Club have been offered materials for a large hangar, at cost, by a local steel concern. Club members will volunteer in erecting the hangar, as soon as a site is chosen and \$4,000 is obtained to pay cost of materials. The city authorities have offered the use of a portable school building as an administration building for the prospective airport.

**T**WO licensed pilots are to be employed by the Endicott Aero Club at its field at West Endicott this season to give instruction to a large class of student pilots, according to Ralph Gardner, manager of the field. The 100-acre area, located 10 miles west of Binghamton along the Susquehanna River, is owned by the Endicott-Johnson Corporation. It has been leveled, seeded and rolled, and is said to be in excellent condition as a landing field.

# Another Unit to the **Travel Air** factory

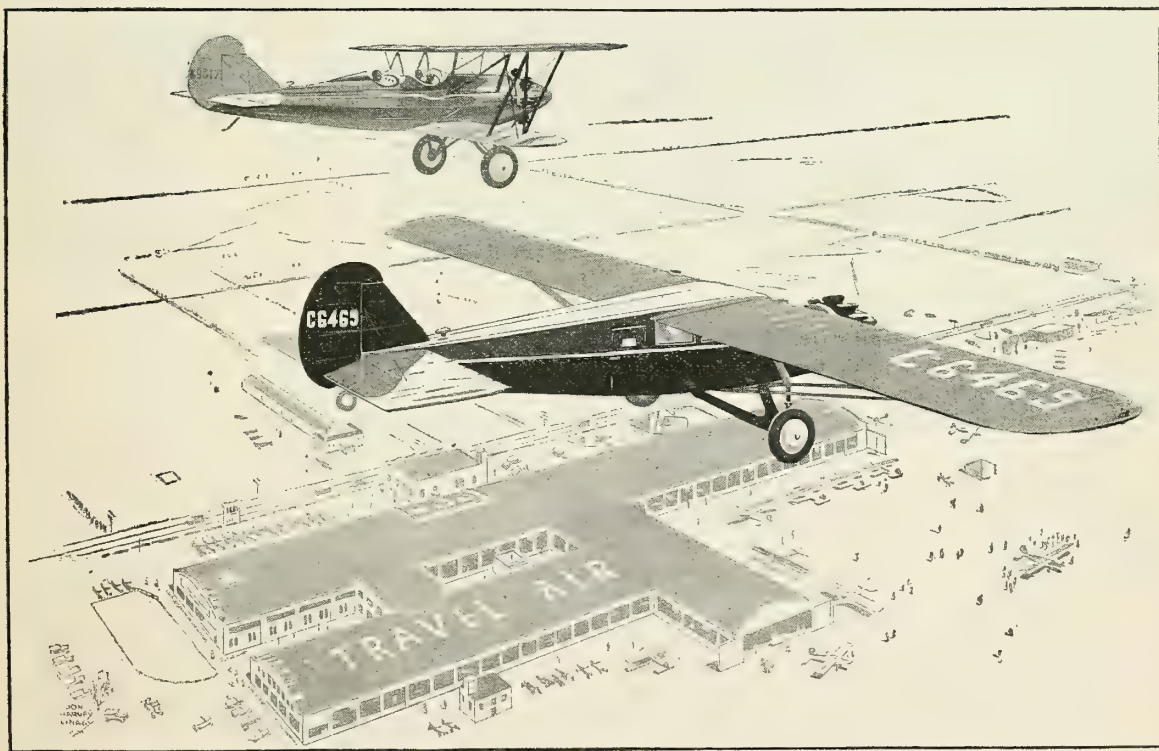
Travel Air—the giant of the airplane industry—takes another big step forward in rushing to completion a fourth factory unit. Thus its capacity has doubled in size within three months—because Travel Airs sell AND STAY sold.

Unknown five years ago—building a plane at a time by hand in a 30x30 foot space in the rear of a planing mill!

Today ample finance—fifth year of continuous manufacturing to exacting standards; over 100,000 feet of floor space filled with modern machinery; night and day operation to produce five types of open cockpit Biplanes and five types of 4 and 6 place Cabin Monoplanes. *Catalog and Story of Travel Air on request.*

The long flying experience and indomitable courage of Walter Beech; the loyalty of his employes; a constant adherence to proven principles of safety construction; a fair selling policy are the reasons for Travel Air growth and success.

## THE STANDARD OF AIRCRAFT COMPARISON



**TRAVEL AIR**  
**COMPANY**  
WICHITA, KANSAS



## BUFFALO AIR NEWS

By W. J. MAHONEY

**T**HE Airport Advisory Board has recommended that the city develop a seaplane base on the municipal land at the foot of Georgia St.

**EDGAR P. LOTT**, manager of operations of the National Air Transport, recently tested a new mail plane at the local municipal port. This plane, which was produced by Curtiss especially for mail use, is powered by a Conqueror engine. The plane has a high speed of 165 miles per hour.

**C**ONSTRUCTION has been started on two hangars at the Buffalo Airport. These hangars will be ready about April 15 and will be 180 by 120 feet. They will be of brick and tile and will include repair shops, washrooms and offices.

**T**HE City of Buffalo will spend \$750,000 on improvements at the municipal airport in the next five years. The improvements will include new runways, construction of a control tower, additions to the administration building, draining of the entire field and the repairing of approaches.



Kinner-engined Fleet biplane; Leigh Wade, test pilot, and L. Bowman of Kinner.

**S**KY VIEW AIR LINES, INC., is remodeling the old Gun Club at the Buffalo Airport. It is to be used as a passenger terminal for the various lines which the company is to run out of Buffalo. The local offices of the firm will also be located in this building.

**G**ENERAL AIRCRAFT of Buffalo will soon test fly a new plane designed for mail use. It will be powered by a Wright Cyclone engine.

**B**Y May 1, the Buffalo Airport will be fully equipped for night flying. This will include boundary lights, an illuminated landing tee, a ceiling light and floodlights. A new 3,000,000 horsepower beacon will also be in operation. The above equipment will cost about \$25,000.

**N**ATIONAL FLYING SCHOOLS, INC., has ordered 110 of the new Fleet training planes to be used in its training schools throughout the country. This company will start operations in the spring and will erect a hangar at the local airport.

## NEW JERSEY AIR NEWS

**T**HE Aero Club of Redbank is to hold an air meet in that town on July 3, 4, 5 and 6. William Tuff is president of the organization.

**S**IX Fokker eight-passenger cabin monoplanes, powered with 450 horsepower Bristol Jupiter engines, have been sold to the Japan Air Transport Co., Ltd., by the Fokker Aircraft Corp. of America. The planes will be used on Japan's first commercial air transport line.

**T**HE Gipsy, a four-in-line air-cooled engine of 100 horsepower, developed by the De Havilland Company of England, will be manufactured by the Wright Aeronautical Corporation in St. Louis.

**F**LYING alone in an Avian plane weighing 800 pounds, Capt. W. Newton Lancaster, chief test pilot of the American Cirrus Engines, Inc., reached Havana recently in his tour about the Caribbean Sea. Capt. Lancaster will traverse the Island of Cuba, to Haiti, to Porto Rico, to the Leeward and Windward Islands, to the northern coast of South America, and then re-

## Aeromarine Klemm Awarded Approved Type Certificate

**M**R. INGLIS M. UPPERCUE, president of the Aeromarine Klemm Corporation, has been advised by the Aeronautics Branch of the Department of Commerce that Approved Type Certificate No. 121 has been awarded the Aeromarine Klemm monoplane.

This is one of the very few light planes to be granted a Department of Commerce certificate of approval under the new requirements of 1929.

Quantity production of the Aeromarine-Klemm monoplane is now under way at the Aeromarine Klemm plant, Keyport, N. J.

**A** SPECIAL de luxe Fokker trimotor plane was completed recently in the Fokker plant at Hasbrouck Heights, N. J., for James A. Talbot, president of the Richfield Oil Co., and chairman of the board of directors of the Fokker Aircraft Corporation.

**A**N order for fifteen New Standard sesquiplanes has been received by the New Standard Aircraft Corp., from Empire Air Transport, Inc., of Syracuse, N. Y. This order, with the business secured at the New York Aviation Show, has oversold the production of the New Standard factory for four months.

**N**EWARK Air Instruction Corporation has been appointed exclusive dealer for Mohawk Pinto planes in Hudson, Essex, Union, and Morris counties, New Jersey, by the Seaboard Aircraft Corp., metropolitan distributor for the Mohawk planes. The parties have signed a ten plane contract.

**G**EORGE DAWS, secretary of New Standard Aircraft Corp., Paterson, has been appointed sales manager of that company.

In addition to his duties as sales manager, Mr. Daws has charge of publicity and advertising. Edward I. Mayer has been designated to assist Mr. Daws in his work.

**N**ATIONAL AIRWAYS, INC., will distribute planes of the New Standard Aircraft Corporation, Paterson, in Virginia, West Virginia, and southern Maryland, according to a contract recently signed with Reuben H. Reiffen, treasurer of the New Standard firm.

**F**LOYD SMITH, of the Switlik Manufacturing Company, Trenton, has designed a new type of passenger parachute, according to Stanley Switlik, president of the concern. This safety device is built into the seat of the plane. When an emergency arises the pilot can release a lever, which drops the passenger through the floor, and the parachute opens automatically.

**C**HARLES F. RUPPRECHT has resigned from the factory managership of the New Standard Aircraft Corp., to organize an engineering service for aircraft manufacturers. Mr. Rupprecht's organization will cover plant design and construction, manufacturing process layouts for production purposes, organization and installation of practical cost and plant operating systems, and consulting services.

turn through Panama and Central America to the United States. The plane is powered with a Cirrus engine.

**T**HE NEW STANDARD AIRCRAFT CORPORATION, of Paterson, has placed an order for 50 American built Cirrus Mark III engines, produced by the American Cirrus Engines, Inc., of Belleville, N. J.

New Standard intends to use these motors in its new training ship which is nearing completion and will soon be ready for a test flight.

**G**EORGE MERZ has been appointed superintendent of the Passaic, N. J., plant of the Fokker Aircraft Corporation, according to Anthony H. G. Fokker. Mr. Merz has been actively interested in aeronautics for the past twenty years, having built an airplane for exhibit at the Boston Aeronautical Show in 1909.

**E**MPIRE AIR TRANSPORT, INC., of Syracuse, N. Y., has been appointed distributor for New York State of planes of the New Standard Aircraft Corporation of Paterson, N. J.



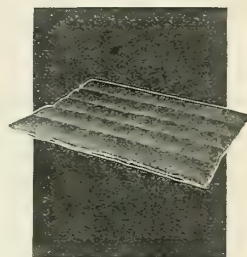
## Silence

**Dry-Zero Achieves Greater  
Quiet-Comfort with the Least  
Possible Weight**



Dry-Zero is revolutionary in its achievement of Quiet-Comfort for the modern cabin transport. With the minimum addition of weight, due to its unusual lightness, Dry-Zero deadens the continuous and excessive roar of the giant motors. It reduces the total sound to approximately 60 sensation units which, according to the research of the U. S. Bureau of Standards, is the degree of quiet-comfort that obtains in a Pullman Parlor car.

This is an important development and one upon which the popularity of air travel largely depends. Safety is established . . . now "Quiet-Comfort" demands attention. Let us prove by test the superiority of Dry-Zero. How by a single application your cabin plane can be sound-deadened . . . and insulated against cold . . . with the least possible loss of "payload" weight. The Dry-Zero Airplane Blanket was developed particularly for cabin plane use—the largest tri-motored planes have been silenced with the slight addition of but 150 lbs. over all. Dry-Zero is permanent in its efficiency . . . It will not settle or void. It is unaffected by vibration. Write for samples of this remarkable material.



*Dry-Zero is made in a special blanket form for airplane insulation. It is easily and quickly applied, with results that are permanent and highly satisfactory. Find out more about Dry-Zero.*

# DRY-ZERO CORPORATION

130 N. Wells Street

Chicago, Ill.



## NEW ENGLAND NEWS

**ENTERING** the field of aviation with a capital of three millions, the Aviation Securities Corporation of New England was incorporated recently to invest in aviation securities and to finance aeronautical development.

**CAPTAIN ALBERT LOVELL EDSON** became director of the Boston Municipal Airport on March 1. Capt. Edson has been active in aeronautics since 1918.

**MAYOR NICHOLS** recently submitted a loan order of \$250,000 to the Boston City Council for the further development of Boston Airport. The loan will provide for a new administration building, and grading, surfacing, and draining of the entire field to afford all-way landings.

**THE** Southern New England Aircraft Company, of New Bedford, Mass., has been appointed distributor for the Bird plane manufactured by the Brunner-Winkle Aircraft Corp. of Brooklyn, N. Y. This firm is appointing dealers throughout Massachusetts and Rhode Island, dividing the former state into five districts.

The Southern New England Aircraft Company has a landplane division with a base at Mattapoisett, Mass., seven miles from New Bedford, under the direction of William W. Batchelder, Alois P. Gast, and

William H. Sparrow. The seaplane division is headed by Joshua Crane, Jr., naval aviator number 296, and Boyd S. Howland. New Bedford and Padanaram Harbors serve as seaplane bases.

**THE** New Hampshire Aviation and Marine Company was organized recently in Concord to sell and operate airplanes and motor boats. The new concern will operate airplanes from bases on Lakes Winnepesaukee and Winnisquam with its principal base at the Concord Airport. This company has been designated an authorized Wright motor service and parts station.

Officers of the firm are: Fred A. Putnam, president and treasurer; Lieut. Robert S. Fogg, vice president; Horton L. Chandler, clerk and assistant treasurer. The directors are Fred A. Putnam, Claude A. Putnam, and Robert S. Fogg.

**WELDING** sheet metal and soft alloys, such as duraluminum, by the use of a shielded arc was explained by P. P. Alexander, research engineer of the General Electrical Co., at the New England Industrial Electric Heating Conference held in the Massachusetts Institute of Technology. The arc, as described by Mr. Alexander, has two electrodes, and does not directly strike the metal to be welded. It can be held far enough away from the metal to prevent excessive melting and oxidation. A jet of hydrogen gas is used to exclude oxygen from the welded parts.

**NEWELL R. SAGE** of the Russell Mfg. Co., of Middletown, Conn., sailed March 23 for Europe to advance the export interests of his firm in France, Spain, Portugal, Italy, Switzerland, Austria, Czechoslovakia, Germany, Denmark, Holland, Belgium and England.

**TWO** new distributors have been announced by the Moth Aircraft Corporation of Lowell, Mass. The Thompson Aeronautical Corporation of Cleveland will distribute throughout Ohio and Michigan, and C. B. Biggins of Harrisburg, Pa., will sell in Pennsylvania. These two distributors placed initial orders for a total of twenty-five Moth planes.

**THE** first Moth airplane of American production, manufactured at Lowell Mass., will be shown at the Detroit All-American Aircraft Show. Sixty-one of these planes have been sold since the beginning of the New York show. This is thirty per cent of the production originally planned for 1929; plans are being made for increasing production.

**THE** sales offices of the Moth Aircraft Corporation have been moved from the Graybar Building, New York City, to the factory at Lowell, Mass. Sales of the company are increasing as the dealer-distributor system expands. Production at the factory is proceeding at capacity schedule.

**PERFORMANCE**

WHEN you take the controls of your Cessna for the first time—and quickly leave the rest behind—then you'll really appreciate that extra 10 to 20 miles per hour that 18 years of constant development and experiment have enabled Clyde V. Cessna, Pioneer Designer, to give you in

**MONOPLANES CESSNA**

**CESSNA**

A MASTER'S EXPRESSION

**CESSNA AIRCRAFT COMPANY**  
WICHITA, U.S.A.

# FOR THE APPROVAL OF THE SPORTSMAN

A semi-military, sport type biplane.  
Every one wants to fly; either for  
business, sport or pleasure . . . . .  
Here is the plane to fulfill that  
want. A plane that creates an  
immediate desire for ownership  
on the part of all who see it.



We will exhibit this snappy  
sport plane at the Detroit  
Show. A valuable franchise on  
this and a training plane, open  
to dealers . . . Demonstrations  
by appointment . . . . . Prices  
to be announced at the show.

THE **SWIFT**  **AIRCRAFT CORPORATION**  
**WICHITA KANSAS**





Brainerd Field, Hartford, Connecticut

## CONNECTICUT NOTES

By L. R. P.

**T**HE Meriden Municipal Airport, located at South Meriden, is in charge of Lieut. Ernest L. Markham. Markham trained with the Navy at Pensacola, was turned out as a finished product in 1921, and flew six years with the National Guard.

Meriden has just voted \$2,000 for a survey of aerial affairs in that vicinity and a constructive plan for making the field and its resources useful to the community. The present landing area, which is flat, and free from natural hazards, is 1660 by 400 feet. Markham and a mechanic constitute the man power, and with a Challenger, they are taking care of half a dozen students.

**L**IEUT. STUART CHANDLER, pilot and instructor-in-chief at the "H and H" (Hart and Hart, if you must know) field at Westhaven, has gone to Hartford to join the Curtiss Flying Service unit at Brainerd Field. The passenger-hopping business is particularly good from the "H and H" field, for it is only a short distance from New Haven on the cement shore road. Sebastian Pond of Bethany Field is pinch hitting. In the meanwhile, fortunately, the hangar is possessed of the dressiest waiting room in the state of Connecticut. Besides the radio and dog (standard equipment in Connecticut hangars), there are wicker chairs and magazines and rest rooms and everything the heart could desire.

**B**RIDGEPORT AIRPORT, operated by the Curtiss Flying Service, is one of the first fields in this part of the country to sport Tarvia runways. Built on filled-in sand foundations, the Tarvia surface presents a billiard table surface that sometimes proves quite surprising to visiting pilots.

Twenty students or thereabouts are taking instruction from John J. Battle, formerly with the Curtiss company at Curtiss Field. Milton J. Hamon is in charge of affairs.

Curtiss equipment at present consists of a Robin and a Travel Air, but by April 1, this will be increased with a couple of Fledgelings, a couple of Consolidated Husky Jrs. and an Ireland Flying Boat.

This last is going into schedule work between Bridgeport and New York, landing on the Hudson at 57th Street.

The Yale Aeronautical Society keeps its training plane, a Waco, in the hangar.

**T**HE Sikorsky factory is well on its way up and will probably be ready for business in June. The first story of the new airport administration building (only the first story will be built now) is finished. Contracts for a second hangar have been let and work starts at once.

**M**ILFORD AIRWAYS, INC., which consists of Ralph Wilson and Stephen Ransom, both ensigns in the naval reserve, and Kenneth Thackwray of Bridgeport, keeps its Command-Aire in the hangar at Bridgeport. These boys are selling Command-Aires, Fairchilds and Ryans.

**T**HE Norwalk field is up on a hill north of the center and is completely surrounded by the nicest woods you ever saw. Rumor has it that Lieut. Harry Generous of Hartford has expressed his official dislike of some of the nearest and largest trees and has suggested that in the interest of students they be dispensed with forthwith. However, with the good old American spirit of coöperation, the owners have set a price of \$40 on the small ones and up to \$400 on the not-so-small ones.

Lieut. John Phillips, who has charge of the field, has over 1,000 hours to his credit and doesn't have any trouble with the trees.

They have an American Eagle and a Travel Air.

**T**HE Borough of Wallingford owns the flying field located in that famous town, and has leased it to the Wallingford Air Transport for a period of ten years. Lieut. Charles F. Arnold, late of the Army, is captain of all he surveys thereabouts. The field is 3,000 by 1,500, and there are five planes in the hangar. They are adding 110 feet to the hangar this spring.

**B**ETHANY FIELD, where Sebastian Pond holds sway, is one of the oldest fields in the state. There are a flock of Wacos and Challengers in the hangar and next door is the famous Airdrome Inn.

The field itself, which is on top of the world, slopes gradually off in all directions and is not too level, but you can't hit anything after you take off because everything is below you. The Waterbury Light Plane Club keeps a ship there.

**T**HE Kimball Aircraft Corp. at Naugatuck recently took the fifth "Beetle" off the block, and it clicked just as well as the first one did. It hasn't cost as much to get it just right as they thought it might, and they feel just like ripping those Tech banners off the walls and having a good old-fashioned parade.

## RHODE ISLAND NEWS

By THOMAS F. BRESNAHAN

**R**HODE ISLAND'S second airplane manufacturing company has begun operations at Hills Grove, occupying part of the building housing the Bourdon Aircraft Company, makers of the Kitty Hawk. The new firm will, according to announcements, produce 10-passenger planes. The company, to be known as the New England Air Transport Company, is headed by George H. Armitage. About 50 employees have already been engaged. The planes will have a wing spread of 80 feet and will be powered with two Wright Whirlwind engines.

Other officials of the company besides Mr. Armitage are M. F. Cashman, vice president; John F. Doherty of Boston, treasurer; and Brig. Gen. Arthur C. Cole, William M. Morgan of Boston and James Duane of Boston, directors.

**T**HE North Attleboro Aeronautical School has been so successful that indications are it will be adopted by the town and supported from the regular educational funds.

**P**URCHASE of land for a Newport airport is now being discussed by the aviation committee of the Newport Chamber of Commerce. Of several sites being considered, the most popular is Sperling Field, 160 acres of high land about four miles from the center of the city. Other possible sites are Sachuest Point and Coddington Field, both having the advantages of land and water.

**A**N indoor model airplane tournament was held at the Cranston Street armory, Providence, on March 23, under the auspices of the New England Model Airplane Association. The tourney was open to boys and girls up to 21 years of age.

**R**HODE ISLAND is still undecided as to where the state owned airport will be located. Voters at the last election appropriated \$300,000 for the project, but the question of placing the airport is in the hands of a committee named by the General Assembly.

Two sites are suitable, one being Gaspee Point outside Providence and the other in Pawtucket. Both are being pushed by the cities in which they are located, but to date

(Continued on next page)

# Each Hamilton Prop...



*is designed to meet the Requirements of the plane upon which it serves . . .*



So important is the efficiency of the propeller to a more perfect performance of the plane that flies behind it . . . that Hamilton propellers are designed to meet the requirements of the ship upon which they are to serve.

This new measure of "custom accuracy" now makes it possible to have exactly the correct propeller for every plane . . . a propeller that will give the maximum speed . . . or power . . . or climbing ability . . . whatever the demands

may be . . . An entirely new standard of performance and efficiency.

If you are in doubt whether or not your propellers are doing the job, write to the Hamilton Aero Mfg. Co., Engineering Dept., specify name and type of plane . . . motor . . . and rated speed. Hamilton "props" are made by one of the oldest organizations in American aviation . . . There are wood "props" and metal . . . with spinner or without. Find out to-day why pilots so often prefer Hamilton.

HAMILTON AERO MFG. CO., Milwaukee, Wisconsin

**Hamilton Aero Mfg. Co.**  
 Milwaukee  Wisconsin



(Rhode Island Air News continued)

neither has been accepted.

The Pawtucket field appears to be the better buy, since it has already been sufficiently developed by the What Cheer Airways to be made to pay from the beginning. The Gaspee Point site is entirely undeveloped, and this alone will cost thousands of dollars.

**T**HERE are 24 aircraft owned by Rhode Islanders registered with the Department of Commerce.

**I**NCORPORATION papers for a new organization to be known as the Rhode Island Model Airplane Association have been sent to the Secretary of State. The purpose of the new organization is to "promote among the citizens of Rhode Island interest in the design, making and flying of model airplanes."

Just as soon as the incorporation is complete, a meeting of all persons interested in model aviation will be called to elect officers, to coördinate the different programs of model aviation in the state, to draw up flying rules, and in general to unify different activities in Rhode Island.

**F**REDERICK S. BLACKALL, JR., was elected vice president and general manager of the Taft-Pierce Manufacturing Co., of Woonsocket, R. I. at a recent meeting of stockholders and directors. The Taft-Pierce concern manufactures special machinery and tools.

## PENNSYLVANIA NEWS

**T**HE March meeting of the Erie Aero Club was held in the hangar at Griswold field, March 11th.

The bond issue and airport were discussed. The club is conducting a membership campaign with its goal as 300 members before April 15th. G. B. Harris is president; M. A. Marts, secretary; and F. B. Krause, treasurer.

**S**YNTHANE CORPORATION at Oaks (near Philadelphia) has completed the erection of its plant, and is now in production of laminated Bakelite products in sheets, rods, tubes and fabricated parts.

The plant, built solely for the production of laminated Bakelite materials, is of modern construction, and special equipment of up-to-date machinery has been installed throughout.

**T**HE Harrisburg Airport Corporation, made up of members of the Harrisburg Chamber of Commerce, has purchased 206 acres of nearly level land lying along the Susquehanna Trail, near New Cumberland, in York County. Although a municipality has been prohibited by law from securing land for an airport outside its county boundaries, it is expected that this session of the Legislature will change this. Plans are now under way for grading the field and determining the positions of the several hangars which will be erected.

## MARYLAND AIR NEWS

### New Berliner-Joyce Plant

**A**WARDING the construction contract for its new \$250,000 airplane factory adjacent to the new Baltimore municipal airport to the H. A. Logan Co., of Baltimore, the Berliner-Joyce Aircraft Corp. expects the plant to be ready for operation by early summer. The Baltimore unit will supplement the work of the Alexandria, Va., plant of the Berliner-Joyce concern now in operation.

The new factory is to be a single-story brick and steel building, having 54,000 square feet of floor space, and headroom for large aircraft assembly operations. The plant will be located on the five and one-half acre tract recently acquired by the firm at the municipal airport. The construction contracts for the airport itself were let March 1.

The contract for the Berliner-Joyce construction calls for completion by May 21. Manufacturing equipment is being assembled, and the entire unit will be ready for operation by early summer. The executive and engineering offices of the firm, now located in the Hearst Tower building, Baltimore, will be moved to the new plant when it is completed.

**C**HESTERTOWN, Maryland, boasts a first class airport. Sponsored by the Chesapeake Aircraft Corporation, of Baltimore, and the Chestertown Board of Trade, the field has been modernized in every detail. Esso gasoline and Standard aviation oil are

(Continued on next page)

# Dayton Bear

FOUR-IN-LINE AIR-COOLED

Production—10 Engines per Day after May 15  
MANUFACTURER'S RATING 120 H.P. AT 1800

Department of Commerce Certificate No. 11

NOW BOOKING ORDERS



See Exhibit at All-American Aircraft Show, Detroit

DETAILED DESCRIPTION AND ENGINEERING  
INFORMATION ON REQUEST

**The Dayton Airplane Engine Company**

DAYTON - - - OHIO



*Announcing*  
The "Oriole"  
O-2

A New High Performance Plane for the Private Owner

A Safe and Economical Ship for the Flying School

On Display to Thousands at the  
Detroit Aircraft Show

**Price \$2995.00**

*A Deposit of \$500 Will Assure Early Delivery*

Illustrated Booklet 4-B Sent on Request

**DOYLE AERO CORP.**

*Office*  
119 S. HOWARD ST.

BALTIMORE · MARYLAND

*Plant*  
3104 ELM AVE.



(Maryland Air News continued)  
available for all planes landing at the field.

The airport was opened formally with an address by Representative T. Alan Goldsborough, chief speaker of the day, and others. Fifteen planes participated in the event.

The Chestertown Airport is the seventeenth Airport to be opened in Maryland.

#### Berliner-Joyce Production Plans

**D**EVELOPMENT of high speed combat planes for submission to the Army and Navy will be the most important activity of the new factory of the Berliner-Joyce Aircraft Corporation which will be completed by early summer at the Baltimore Municipal Airport. This plant will also produce Berliner monoplanes, a new all-metal two-place cabin monoplane, a metal propeller, and a Monel metal pontoon for the Navy, two of which have been ordered for experimental work.

The board of directors of the Berliner-Joyce concern includes: W. Frank Roberts, president of the Standard Gas Equipment Co., of Baltimore; Charles L. Phillips, vice president of the United States Fidelity and Guaranty Co.; Col. B. F. Castle, director of the Great Lakes Aircraft Corp., of Cleveland; Ralph B. Leonard, New York City; Townsend Scott, of the investment banking house, Townsend Scott & Sons, Baltimore; E. D. Edmonston, general superintendent of the Consolidated Gas, Electric Light &

Power Co., Baltimore; Henry Berliner, vice president of the Berliner-Joyce Corp., in charge of construction and production; and Temple N. Joyce, vice president of the Berliner-Joyce Corp., in charge of sales.

#### Hagerstown Air News

By John C. Middlekauff

**W**ORK is to start at once on the new factory of the Kreider-Reisner Aircraft Co. The new building will be a one-story fireproof steel and concrete structure, 320 by 120 feet. This building and the present group of six will permit the corporation to maintain its production schedule of 15 planes per week.

The following orders have been received by the company: Six C-2s for Skyways of Michigan, five ships for Parks Air College, two for Starlighters, Inc.; one Special C-2 for Semans, Uniontown, and one Special C-2 for Pitcairn of South Carolina. Delivery will be made on a Special Warner (C-5) and Comet (C-4) to Skyways of Ohio.

**M**R. STICKLEY of W. B. Moses & Sons, Washington, D. C., recently flew to Hagerstown to deliver a Government furniture contract to the Beachley Furniture Co. and to take back the antique furniture which will be displayed at an exhibition during Founder's week. In an interview, Mr. Donovan R. Beachley stated that an airplane was used because it is the

most economical, safest and fastest means of transportation.

**M**R. GEORGE HARDMAN of the Naval Aircraft Factory at Philadelphia has joined the engineering department of the Kreider-Reisner company.

**T**HE Challenger Flying Service now has 17 students. Bob Chlosey is the instructor.

**M**R. A. H. KREIDLER, president of the Kreider-Reisner Aircraft Company, of Hagerstown, recently delivered before the Tome Aviation Club, Port Deposit, a speech on the Challenger airplane and his trans-continental air race experiences of last year.

#### DELAWARE AIR NEWS

##### New Bellanca Plane

**A** NEW Bellanca plane is soon to be put into production in the factory of the Bellanca Aircraft Corp., at New Castle, Delaware, according to G. M. Bellanca, president. The New Castle factory of the firm has been enlarged in preparation for the production of the new plane, and to accommodate the demand for the standard Bellanca CH model.

The new Bellanca will be a 14-place craft, and will be built in two types, differing in power plants. One will use a single Wright Cyclone engine of 525 horsepower, and the other will use three Wright Whirlwinds, totaling 900 horsepower.



# Aircraft Finishing Materials

... by »**TITANINE**»

REGISTERED TRADE MARK

... Clear Nitrate and Acetate Dopes ... Pigmented Dopes  
Flexible Wing Lacquer ... Dope Proof Paint ... Ti-Two  
Dope in All Colors ... Wood and Metal Lacquer and Primers  
Varnishes ... Enamels ...

Manufactured by

**TITANINE, INC.**

Union, Union County, New Jersey

Contractors to U. S. Army and Navy



Schneider Trophy



## Plain Talks on Fine Bearings

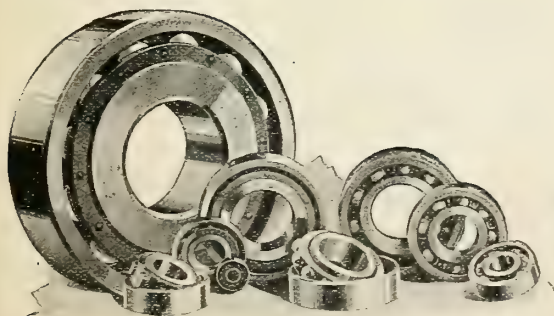
No. 6.—The factor of safety in aviation equipment has reached a figure undreamed of a few years since. Not least among the factors which have achieved this happy result are the efforts of those manufacturers who—despite price competition—have steadfastly refused to lower quality.

NORMA-HOFFMANN Precision Bearings continue to be manufactured to standards dictated by maximum safety and serviceability. Proof of their super-dependability is found in the achievements of Lindbergh, Byrd, Chamberlin, Maitland, Wilkins, Kingsford-Smith and Goebel.

### NORMA-HOFFMANN BEARINGS CORPORATION

Stamford — Connecticut

PRECISION BALL, ROLLER AND THRUST BEARINGS





## DETROIT AIR NEWS

BY FRANK BOGART

AMERICAN planes to go into commercial usage in China have been ordered by the Department of Communications of the Chinese Nationalist government from the Stinson Aircraft Corp. After April 1st, this concern will be located in its new 80,000-square-foot plant, where production will be at a much greater rate than in the old location.

THE first half of March showed much more encouraging traffic reports than were forthcoming either in January or February, according to Stanley E. Knauss, general manager of Stout Air Services, Inc., operators of the Ford transport planes between Detroit and Cleveland and between Detroit and Chicago. The Cleveland line showed 196 patrons the first half of March, and the Chicago line, 122.

OF about 200 pupils in the first Detroit ground school classes conducted by Curtiss Flying Services, Inc., half are between 21 and 25 years of age, but 18 per cent are more than 30 years old, and some of this group are as old as 52. Fourteen per cent are between 17 and 20, and 19 per cent are between 26 and 30. Plans for inaugurating actual flight instruction on the Grosse Ile airport are to be announced shortly. About \$200,000 worth of buildings are to be erected there by the Michigan subsidiary corporation of the Curtiss national chain of airports and flying schools.



Insignia to be worn by air mail pilots.

ON April 1 National Air Transport, Inc., will abandon its Toledo-Detroit feeder service to the overnight Chicago-New York air mail service.

THE Ford Motor Company has nearly completed its order from National Air Transport for 10 of the fast 14-passenger Wasp-motored Ford transports. The Stout Air Services, Inc., will cooperate with N. A. T. in offering seven-hour passenger service between New York and Detroit, leaving New York at 12 noon and arriving here before 7 p. m., depending upon the ultimate time fixed for the transfer at Cleveland.

STINSON SCHOOL OF AVIATION (Jack B. Stinson) has leased a 200-acre field for its flight instruction activities this spring and summer. Stinson is working on plans to take over the field permanently and make it a headquarters for his school. These will include erection of a clubhouse where students may live.

DWIGHT W. DAVIS has been named his assistant by Edward F. Schlee, president of Schlee-Brock Aircraft, Inc., Midwestern and Southern distributors of

Lockheed planes. Davis has had 20 years executive experience in the merchandising end of the automobile accessory field.

CAPTAIN M. A. SINE, instructor of the Eighty-fifth Division, Air Corps Reserve, has opened private classes in aircraft construction and flight principles. He conducts them in Webster Hall Hotel.

THE Avian Flying Club, of which Ralph W. Snoko is instructor, has picked new officers as follows: H. F. Walters, president; D. F. Turley, vice president; H. M. Seitz, secretary; and C. A. Dayton, treasurer. The club is small but growing, and more than half its members have Federal pilots' licenses. The club owns one Eagle-rock and will purchase another this month.

### Berry Brothers New Color Schemes

WILLIAM HEASLIP, a prominent artist who specializes in airplane subjects, was commissioned by Berry Brothers, Inc., to demonstrate the application of bird color schemes to well-known airplanes. Color plates were prepared for insertion in the aeronautical publications. The ships illustrated are all protected with Progressive Aircraft Finishes and are appearing in the same order their manufacturers adopted Perryloid.

With this series Berry Brothers is introducing an entirely different system for finishing airplanes and is striking a new note in aircraft advertising. Manufacturers can adopt

(Continued on next page)

# At Detroit All-American Show New Aircraft Materials Shown by HASKELITE

NEW types of HASKELITE and PLYMETL panels developed to meet the rapidly increasing demand for modern aircraft materials are included in our exhibit at the Detroit show.

New insulating panels such as those used in the construction of the "Question Mark," unusually attractive decorative panels, aluminum and duralumin PLYMETL, etc., hold much of interest and value for builders, dealers, and fliers.

Every aircraft engineer and manufacturer calling at our booth will be given valuable bulletins and new engineering tables. No charge for these, and no obligation.

**Haskelite Manufacturing Corporation**  
120 South LaSalle Street  
Chicago, Illinois

Railway & Power Engineering  
Corp., Ltd.  
Toronto, Montreal, Winnipeg,  
New Glasgow



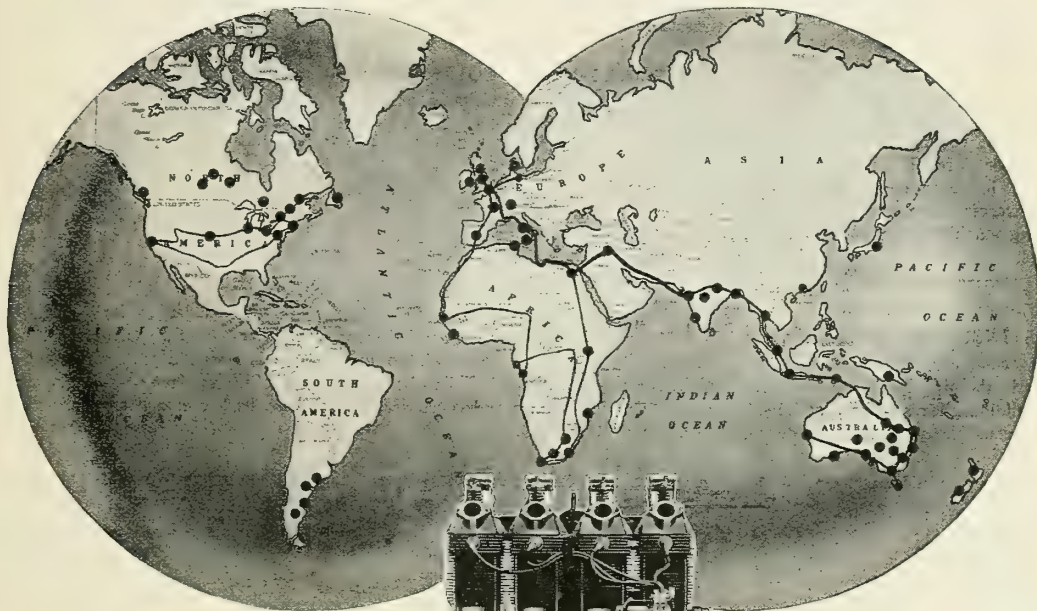
California Panel & Veneer Co.  
955 S. Alameda Street,  
Los Angeles, Calif.

AD 4-Gray

At all recent aircraft shows,  
AT LEAST 85% of manu-  
facturers exhibiting were  
HASKELITE USERS.

**PLYWOOD**  
**HASKELITE**  
**PLYMETL**

# The CIRRUS WORLD RECORD



## 1925

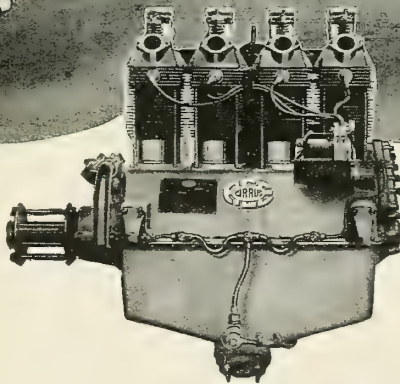
The Cirrus Mark I 60 H. P. was the first low power engine to pass 100 hour Air Ministry test, passing it at the first attempt. Sir Alan Cobham flew from London to Zurich and back, 1,000 miles, in one day. Chosen by English Air Clubs, for light planes.

## 1926

Won Kings Cup Air Race—16 hours of continuous flying at full throttle—over course of 1,464 miles. At Bournemouth Air Race Meet, won 8 firsts out of 10 events. Winner of Australian Air Derby.

## 1927

Cirrus Mark II 80 H. P. engine developed and passed Air Ministry 100 hour test. Capt. Stock and Capt. Leete flew in two machines from London to (Karachi) India, a distance of 5,500 miles, a record for light planes. Won Kings Cup Air Race, second year in succession. At Bournemouth won 11 firsts, 15 seconds, and 12 thirds. Longest light airplane non-stop flight by Mr. Bert Hinkler from London to Riga (Latvia), a distance of 1,200 miles in 10¾ hours. Lieut. R. R. Bentley flew from London to Capetown, South Africa, 8,000 miles, longest flight ever made by unaccompanied pilot.



Performance in the air is the final test of an aircraft engine.

The above records show the progress and development in power and reliability of the Cirrus Engines. They prove the fact that this engine is the most reliable light aircraft motor manufactured today. The engine's reputation rests not upon words but upon actual air achievements. Cirrus Engines are flown in more countries of the world than any other light aircraft engine.

From the freezing temperatures of northern Canada to the burning heat of mid-Africa, these engines are doing their jobs and creating records by performance. It has well been said that **THE CIRRUS ENGINES MADE LIGHT AIRCRAFT POSSIBLE AND PRIVATE FLYING SAFE AND PRACTICAL.**

For Further Information Address

Lady Bailey made light plane altitude record.

## 1928

Cirrus Mark III 95-100 H. P. engine developed and passed Air Ministry test of 100 hours. Longest solo flight—England to Australia, 12,000 miles in 15½ days, by Mr. Bert Hinkler. Longest solo flight by a woman pilot—Lady Heath's flight from Capetown to London—8,000 miles. Longest flight by light plane—England to Australia and Tasmania—17,400 miles—Capt. W. N. Lancaster and Mrs. Keith Miller, co-pilots. Longest distance flown by a woman. Lady Heath established light plane altitude record over 18,000 ft. Won first in reliability, speed, economy, climb, aerobatics, controllability and maneuverability at Gothenburg International Flying Meet. Won 3 firsts at Dutch International Meet. Miss Amelia Earhart's solo tour of 8,000 miles from New York to Los Angeles and return.

## 1929

Finish of Lady Bailey's 18,000 mile tour of Africa. The most wonderful solo flight ever accomplished by a woman over routes uncharted and never flown before. The longest solo flight ever made.

**AMERICAN CIRRUS ENGINES, INC.**  
WASHINGTON AVENUE, BELLEVILLE, N. J.



(Detroit Air News continued)

any of the color combinations with the assurance that it will enhance the beauty of their ships and provide enduring protection.

#### National Glider Conference

ON April 10th, while the All-American show is being held in Detroit, the National Glider Association, Inc., together with all glider enthusiasts who can attend, will convene at the Hotel Statler. The program of the National Glider Conference includes a general discussion of the progress of gliding in America, and speeches by Edward S. Evans, president of N.G.A.; Porter Adams; Dr. Wolfgang Klemperer; Prof. Alexander Klemm of New York University; Major Reed Landis, and Amelia Earhart.

COMPLETING a tour of the continent, the *Patrician*, commercial transport built by the Keystone Aircraft Corp., of Bristol, Pa., will be in Detroit during the All-American Aircraft Show there. The Keystone-Loening amphibian air yacht will also be displayed.

#### Stinson's 14,000 Hours

EDDIE STINSON, airplane manufacturer, recently completed his fourteen thousandth hour in the air. He began his flying career by building gliders in 1903 and 1904. In 1914 he went barnstorming, and during

the war flew as a war pilot. He has twice held the world's endurance record for flight.

ONE Gipsy Moth landplane and one Gipsy Moth seaplane will be exhibited at the Detroit All-American Aircraft Show by the Moth Aircraft Corporation of Lowell, Mass.

AT the recent annual meeting in Detroit of the stockholders and directors of the AC Spark Plug Company, all officers were re-elected as follows: B. W. de Guichard, president and general manager; H. H. Cur-tice, vice-president; T. G. McDougal, vice-president; W. E. Ross, comptroller; T. S. Merrill, secretary; and M. L. Prentis, treasurer.

FEDERAL MOGUL CORP. has established a die-casting division for handling the contract manufacture of die-cast parts. The company has installed fully automatic diecasting machinery.

#### MICHIGAN MAIL CONNECTION

AIR mail service connecting Bay City, Saginaw, Flint, Pontiac, and Detroit, Mich., with the New York-Chicago overnight service at Cleveland was to be started April 1, by the Thompson Aeronautical Corporation of Cleveland.

THE Whitman Barnes-Detroit Corporation has changed its name to Whitman and Barnes, Inc. The longer name, which was chosen to carry on the names of the merging firms, was found to be cumbersome.

#### MICHIGAN AIR NEWS

ANDREW (Duke) REID has joined the Szekely Aircraft Corporation to take charge of field sales, according to Jack Whittaker, vice president of the concern.

A member of the "Early Bird" fraternity, Mr. Reid has been in aeronautical work since 1909 when he made his first flight.

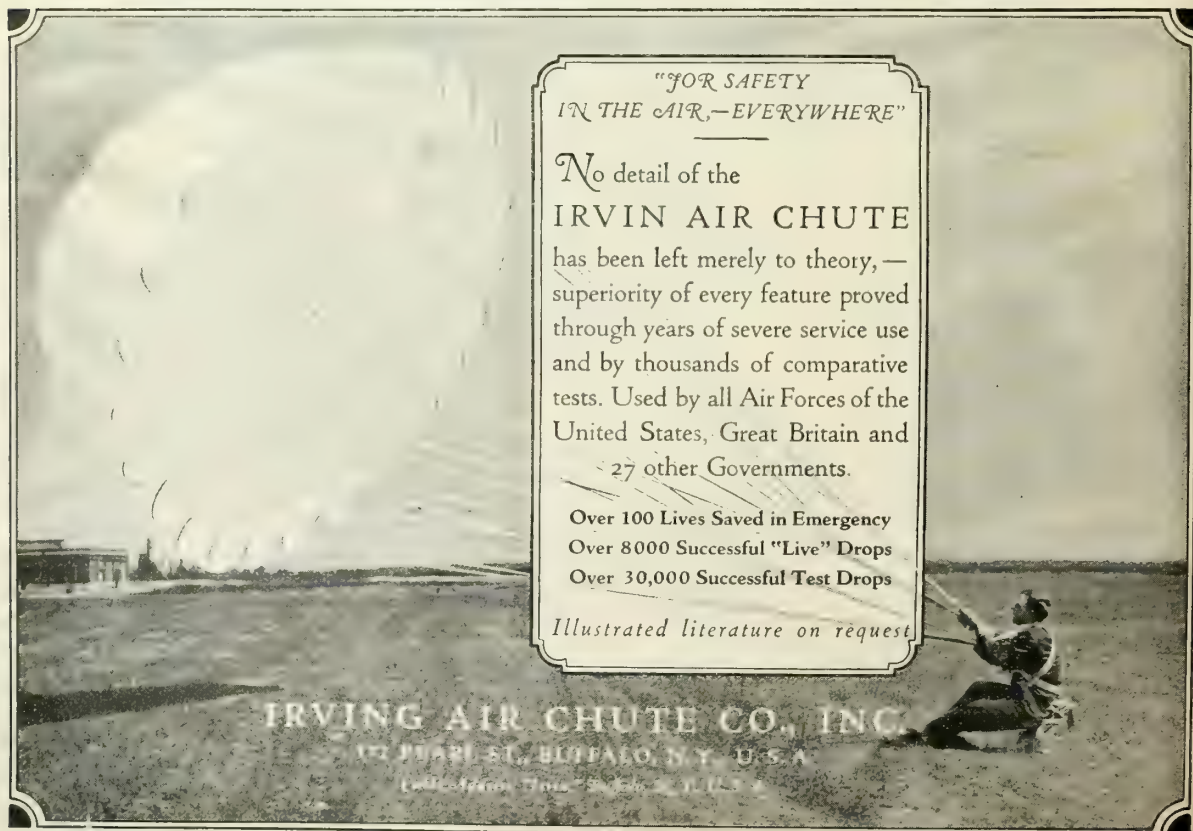
THE Szekely Aircraft Corporation has added a new building to its plant in Holland to take care of the increased production of planes and motors which is the result of recent orders.

The company is adding to its personnel well-trained men for each particular field needed. The following men have recently been added to the force:

"Duke" Andrew Reid, who started his aeronautical career in Baltimore, Md., in 1910 when he assisted in promoting the first aviation meet to be held in that city. Mr. Reid is joining the Szekely corporation in the capacity of mid-west manager.

Tom Mitchell will work in the central territory of the country with Duke Reid. He has an R.F.C. background that started in 1917 at Hendon, England. Since the war, he has engaged in barnstorming, trans-

(Continued on next page)



"FOR SAFETY  
IN THE AIR,—EVERYWHERE"

No detail of the  
**IRVIN AIR CHUTE**  
has been left merely to theory,—  
superiority of every feature proved  
through years of severe service use  
and by thousands of comparative  
tests. Used by all Air Forces of the  
United States, Great Britain and  
27 other Governments.

Over 100 Lives Saved in Emergency  
Over 8000 Successful "Live" Drops  
Over 30,000 Successful Test Drops

Illustrated literature on request

**IRVING AIR CHUTE CO., INC.**  
125 PEARL ST. BUFFALO, N.Y., U.S.A.  
(Call for Terms and Conditions)

# Inspiration

## for prospective AIRCRAFT SALESMEN

You, sir, are thinking of selling airplanes. As a man of good judgment you will want to connect with a popular ship, a strong, established organization, and a manufacturer that will help you to success. You want to be *sure* of these things before you put your capital and energy to work.

You should *know* the Alexander Aircraft Company. You should *know* what the largest aircraft sales organization in the country is doing—and *why* an EAGLEROCK franchise is most valuable. Read and judge where your opportunity lies:

### Random Examples of Distributor Success

Dr. Geo. Bennett, formerly a practicing dentist, now operator of one of the largest flying schools in the country, sold four EAGLEROCKS during February. This is no fortune in commissions but a mighty good income for the twenty-eight days known as a dull month.

Jack Frye once operated a few ships on a small scale. Now his company has a profitable transport line and flying school. His company and dealer organization has been responsible for the sale of most of the eighty-two EAGLEROCKS flying in his state.

J. Shelley Charles, a lone operator and a distributor in North Carolina, Virginia, and District of Columbia, has increased his net assets \$26,000 in three years—and that, in the major part thru EAGLEROCK sales.

### Sales Promotion

Several master sales promotion men make periodic visits in EAGLEROCKS to distributors and dealers to strengthen organizations and to help close sales.

Over one hundred Alexander Film Salesmen contact with thousands of business men every week. They create EAGLEROCK prospects and render every aid possible to aircraft salesmen in their territories.

The Alexander Sales Course, a practical and proven course in salesmanship is given without charge to each new member of the national sales organization.

The Animator, a weekly newspaper, keeps every salesman of the "Industries" informed as to company progress and policies and is a medium for exchange of profitable ideas.

### Publicity

Every important aeronautical journal as well as a number of trade publications carry EAGLEROCK advertising in either black and white or in colors.

The Aircraft, a live, 24 page monthly magazine, covers a field of 25,000 active prospects. Besides the home office mailings a fair portion of each issue is sent to EAGLEROCK salesmen for personal distribution.

Motion picture advertising for EAGLEROCK is shown constantly in many theatres throughout the United States. The Alexander Film Company, another division of the Alexander Industries, Inc., is the largest screen advertising company in the world. It has contracts with over 2500 theatres throughout the country. That means 8,000,000 actual reader circulation weekly or about three times the circulation of the most widely read magazine in America.

Folders, broadsides, illustrated letters, flying instruction books, stickers, banners, post cards, etc., all enter into the list of advertising helps.

A live publicity department supplies 200 publications with interesting editorial facts regarding Alexander activities and EAGLEROCK planes.

### A Progressive Institution

Sales volume of the Alexander Aircraft Company amounted to over \$1,008,500 during 1928. This was an increase of more than 50 per cent over the previous year.

Investment in aircraft buildings, equipment and materials was more than doubled during 1928. Immediate plans call for half a million dollars additional to be invested early in 1929.

The present factory is capable of *one ship an hour* production. Volume production as practiced in building EAGLEROCKS means a lower manufacturing cost with a corresponding increase in the possible market and in value to the customer.

### All This Is Valuable

Every effort is made on the part of the Alexander Aircraft Company to make franchises as valuable as possible to distributors and dealers. As they prosper, so shall the company prosper and become able to render still greater value for the customer's dollar.

### Opportunities for Dealers

Those who become EAGLEROCK dealers *now* have excellent opportunities to become distributors through thorough development of their territories. This was demonstrated in 1928 by Robert Westover, head of National Parks Scenic Airways and owner of a garage at Billings, Montana. As a dealer, the firm sold more airplanes during 1928 than any other EAGLEROCK dealer in the United States. In January, 1929, it was made a distributor over Montana and Western Wyoming.

*Certain choice territories are still open to dealers and distributors. Write to us.*



Formal  
Announcement of the  
new EAGLEROCK BULLET  
will be made  
in April.

J. A. McINANEY, Vice-Pres., in Charge of Sales.

ALEXANDER AIRCRAFT CO., Colorado Springs, Colo.

I am interested in the purchase of an EAGLEROCK—check ☐

I am interested in open EAGLEROCK territory—check ☐

Name .....

Address .....

Business or Profession .....

(A. D.)



(Michigan Air News continued)

port, instruction and manufacturing work.

Cyrille Peabody will be factory representative in the East. He began flying in 1922 at Central Flying School, Upavon, Berkshire, England.

Lieut. R. Noble Estey has signed up with the firm and will have charge of the Eastern distribution of the Flying Dutchman and the Szekeley motors.

Lieut. Estey's aeronautical experience goes back to 1913 when he received flying instructions under Ray Morris on the third flying boat built by Glenn Curtiss.

He received advanced instruction at Pensacola, Florida, at the first U. S. Navy Air Station in 1916. He succeeded in passing the test of the Lafayette Flying Corps and was released from the Navy for active duty in this Corps. He joined this famous corps during the summer of 1917 in Paris and in the fall of that year transferred to the U. S. Air Service at Tours, France.

Upon leaving the service in June of 1919, he became interested in commercial aviation.

### Michigan Air Tour

By KARL F. ZEISLER

THE city of Pontiac will sponsor an air tour of Michigan, covering 1,200 miles and visiting 25 cities, as the preliminary to an aviation meet in connection with the dedication of the municipal airport June 14. Manufacturers of all aircraft and equipment distributed in Michigan have been invited to participate in the tour. The purpose of the

tour is to stimulate interest in aviation, particularly as regards the establishment of municipal airports.

Silver cups will be awarded participants in the tour, and the proceeds, which will be underwritten by local business men, are to go for cash prizes for winners in the meet at the Pontiac airport.

The meet will be staged under the rules of the Federation Aeronautique Internationale, tentative permission having already been secured from the National Aeronautic Association. The events will include racing, parachute jumping, dead stick landings, night flying, bomb dropping and balloon busting. The First Pursuit Group from Selfridge Field, Mt. Clemens, and the 107th Observation Squadron of the Michigan National Guard will attend and participate in the meet.

Pontiac has a 240-acre airport, fenced and equipped with full floodlights for night flying. There is a 20-plane brick and steel hangar, which is owned by the city and leased to several operators.

AIRPLANE manufacturing capacity has been increased 400 per cent in the last year at the Ford airplane factory at Dearborn.

ERLE P. HALLIBURTON, president of the Southwest Air Fast Express, returned to Dearborn one month after placing an order for five trimotor Ford transports, and ordered three more. Three planes of the first order have been delivered.

AN air package service will soon be added to the activities of Thompson Aeronautical Corp. in connection with the new Bay City-Cleveland air mail route which is to be inaugurated April 1st. Package freight will be accepted to and from all points on the new route, including Cleveland, Detroit, Pontiac, Flint, Saginaw, and Bay City. A delivery and collection service in Detroit and Cleveland will be a feature of the new service.

### INDIANA AIR NEWS

THE Davis Aircraft Corporation of Richmond, Ind., began production on the American Moth in its Richmond plant March 1. Lieut. Pat Love, formerly superintendent of the Vulcan Aircraft Co., of Portsmouth, Ohio, is general superintendent of the firm. The Davis concern bought the Vulcan company, and moved its machinery and materials to Richmond.

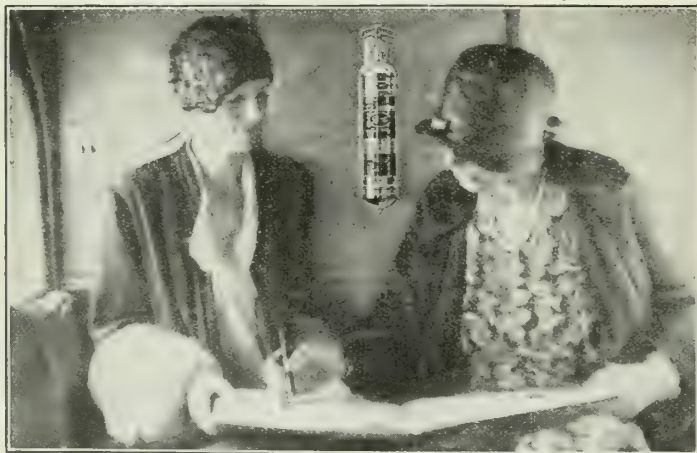
WORK on the Evansville Airport, under the direction of B. Russell Shaw Co., Inc., airport engineers of St. Louis, Mo., is now under way.

Ground was broken recently for the drainage system, and contracts will be let immediately for night lighting, hangar, terminal building and other improvements.

Evansville is an important junction city on the air mail route from Chicago to Atlanta, Georgia. This line is operated by Interstate Airlines.

Photo by courtesy of

Hearst's International-Cosmopolitan for December, 1928



Twenty-five hundred feet in the air, Amelia Earhart and Mrs. George Palmer Putnam sign the guest-book of James H. Rand's airplane.

## Follow the Leaders, Install Pyrene Fire Equipment

THIS news photo of Miss Amelia Earhart, the famous trans-Atlantic flyer, from a recent issue of Cosmopolitan Magazine, clearly shows that the plane is Pyrene-protected.

Pyrene saved Courtney, the English flyer. In mid-Atlantic his back engine caught fire while flying at 1500 feet.

Pyrene immediately extinguished the flames. Famous flyers favor Pyrene.

Protect your planes, your hangars and your plants with Pyrene Fire Equipment. It is best known and most dependable. There is a type of extinguisher for every hazard in every branch of aviation.



PYRENE MFG. COMPANY  
NEWARK, NEW JERSEY

Branches: Atlanta — Chicago — Kansas City  
San Francisco

Makers of Fire Equipment since 1907

**I**n HANGAR building  
...a new field with new  
untried problems .....  
nothing can guide you  
but EXPERIENCE .....

*at it since  
War Time!*

The H. H. Robertson Company has been helping to build hangars since the days when the United States was building war hangars in France.

This photograph shows a typical U. S. Government hangar with roofs and sidewalls of R. P. M. (Robertson Protected Metal.)



# ROBERTSON

*Has the Experience*

Hundreds of strange and bewildering new questions confront you when you build a hangar.

- Shall you cover it with unprotected metal roofing and siding and take a chance on rust destroying it?
- Or shall you go to the other extreme and tie up thousands upon thousands of dollars in a hangar of heavy construction?
- Or what about this RPM material that is a happy medium between the two extremes?
- And shall you put on ventilators, or take a chance on the motor exhaust fumes getting out by themselves without hurting anyone?

And so on and on—many questions and problems that never came up in other fields of construction. Lots of people can guess at the answers... but the only real answers come from experience.

The H. H. Robertson Company CAN answer these hundreds of questions for you from experience. Its record in hangar-building is one of the longest and most complete in the history of this new industry. That experience has been gained in all four corners of the world.

Take advantage of that experience. Bring your problems to Robertson engineers. Their suggestions will cost you nothing and will not obligate you. Write or send your blueprints.

H. H. ROBERTSON CO. • PITTSBURGH, PA.

## ROBERTSON





## OHIO AIR NEWS

BY T. E. LUNSFORD

THE state air code, which was introduced by David S. Ingalls of Cleveland, has been passed by the Ohio Legislature. It provides for the creation of a state aeronautics bureau to be headed by a commissioner who is empowered to prescribe regulations governing aviation, including the licensing of aircraft and airmen. The regulations will conform, insofar as possible, with the Air Commerce Act of 1926. Three fees are provided in the law, amounting to \$15 in each instance, and provide for airmen's licenses, examination and inspection of aircraft and issuance of certificates of registration.

A BOND issue for \$384,000 has been passed by the Akron City Council to add 125 acres to the municipal airport and to furnish funds for completing the grading and draining on the present airport. Funds amounting to \$1,441,000 have been appropriated so far for the airport, and another bond issue of \$312,000 to complete the field is contemplated by city officials next year.

GOODYEAR engineers are working on plans for moving the company's dirigible hangar at Wingfoot Lake to the site of the Akron municipal airport, near the location of the huge hangar which Goodyear Zeppelin is erecting to house its super-dirigibles.

AT the primary election next August, Dover and New Philadelphia citizens will be given the opportunity of accepting or rejecting a bond issue of approximately \$60,000 for an airport for the two cities.

C. M. SHAFER, president of the Shafer-Hammond Lumber Co., has been named chairman of the Massillon airport committee of the chamber of commerce.

AN aviation school, air taxi service and airplane sales agency will be conducted in Lorain by Lorain Airway Service, Inc. Negotiations to purchase a 130-acre tract on Leavitt Road are under way. A first-class airport, to be known as Port Mills, will be established at this site.

MAYOR C. C. CURTIS of Canton is continuing his fight to prevent the establishment of a municipal airport there by vetoing an ordinance which would have provided for an airport commission.

To date, the mayor has maintained a 100 per cent record, using the blue pencil on every ordinance which the city council has passed on the airport project. Three ordinances to establish an airport were vetoed but the third one the council passed over the veto. Then came a resolution for \$78,000 in bonds to purchase the Harrisburg Road site. This was vetoed and passed over the veto. Now the resolution to provide for a commission to run the airport also has been vetoed, but it is expected that the

council will repass the measure and make it possible to start actual work soon. The contention of the mayor is that an airport is not necessary at this time.

THE radio beacon, which has been under construction at the Transcontinental Airport at Toledo, is now ready for use. The beacon has a range of 20 miles. The device is operated in conjunction with directional radio beacons installed to guide fliers between Chicago and Cleveland.

THE Aircraft Safety Devices, Inc., has been incorporated at Cleveland with a capital stock of \$20,000. The incorporators are Glen Offenbacher, Carroll L. Hunter and Katheryn T. Wright.

THE Kenton airport will be formally opened and dedicated in April when a small plane, made by Bryan Heilman and Pete Ambacher, of Kenton, is to be flown from Kenton to Columbus. The craft is said to be capable of flying 42 miles on a gallon of gasoline and of making 100 miles an hour. It has a 26-foot wing spread and is 16 feet long. It is powered with a Henderson rebuilt four-cylinder motorcycle motor.

THE contract for the construction of the administration building at Cleveland's new airport has been awarded to the Reaugh Construction Co., at a bid of \$81,000. In

(Continued on next page)

## NEWARK LIGHTS UP

with B. B. T. of course

AMERICA'S LEADING AIRPORTS, NOW B. B. T. LIGHTED, INCLUDE:—

Portland, Maine  
Boston, Mass.  
Worcester, Mass.  
Hyannis, Mass.  
New Brunswick, N. J.  
Lakehurst, N. J.  
Newark, N. J.  
Wilmington, Del.  
Philadelphia, Pa.  
Bellefontaine, Pa.  
Anacostia, D. C.  
Quantico, Va.  
Atlanta, Georgia  
Miami, Fla.  
Columbus, Ohio

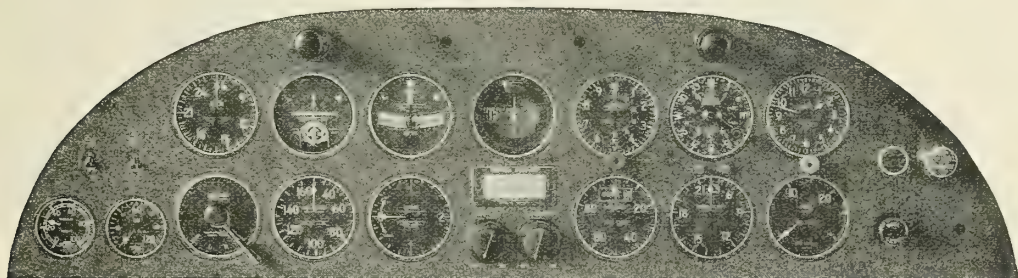
Cincinnati, Ohio  
Cleveland, Ohio  
Toledo, Ohio  
Detroit, Mich.  
Chicago, Ill.  
Iowa City, Iowa  
Des Moines, Iowa

Omaha, Nebraska  
Kansas City, Mo.  
Tulsa, Oklahoma  
Houston, Texas  
North Platte, Neb.  
Cheyenne, Wyoming  
Salt Lake City, Utah

Elko, Nevada  
Reno, Nevada  
Oakland, Calif.  
Bakersfield, Calif.  
Los Angeles, Calif.  
San Diego, Calif.  
Tucson, Arizona  
Fort Worth, Texas  
Dallas, Texas  
Oklahoma City, Okla.  
Jacksonville, Fla.  
St. Paul, Minn.  
Hartford, Conn.  
Moline, Ill.  
Fairbanks, Alaska



## What's New in Aircraft Instruments?



*Pioneer Instrument Board and Instruments on Major Clarence M. Young's (Department of Commerce) Whirlwind Stearman*

**A**T THE DETROIT AIR SHOW we will exhibit the many new improvements and developments that have been made in Pioneer Instruments since April 1928.

### Uniform Small Size

In one year's time we have made our entire line available in the new small uniform size. This simplifies the design of the instrument board and makes instrument flying easier for the pilot.

### New Magnetic Compass

The Pioneer Magnetic Compass, type 356, shown on the instrument board has a round dial mounting and is compensated with a screw driver. It is another new Pioneer development which adds convenience and beauty to aeronautical instruments.

### Air Transport Panel

Still another new item which will be

exhibited at the Show is a standard Air Transport type panel which includes the Air Speed Indicator, Bank and Turn Indicator, Climb Indicator, Tachometer, either Magnetic or Earth Inductor Compass (interchangeable) and Altimeter.

All instruments are indirectly illuminated and all electric bulbs are accessible to the pilot so that he may change them in flight in case one burns out.

### Small Series Gauges

We will also show our new small series of Pressure Gauges, Thermometers, Ammeters and Voltmeters.

In the aircraft instrument field, Pioneer is synonymous with progress. We invite you to visit the Pioneer booth and become acquainted with the latest developments in aircraft instruments and equipment.

**PIONEER INSTRUMENT COMPANY**  
**754 LEXINGTON AVE. BROOKLYN NEW YORK**



(Ohio Air News continued)

addition to quarters for Major John Berry and his staff, the administration center will contain customs and immigration offices, mail room, ticket office, waiting room and restaurant, rest rooms, pilots' quarters, information room and a first aid room.

**OPERATION** of a flying school at the Columbus municipal airport will be limited to one organization, according to a decision of city council. However, this was modified to the extent that other responsible schools may be permitted on the field later on if the demand is great enough.

**LIEUT. KARL L. LANGE**, formerly of the U. S. Naval Air Station at Lakehurst, has joined the Goodyear service as pilot.

**C. O. BELL**, manager of Lansdowne Field, Youngstown, has resigned his position to become a pilot for Clifford Ball, Inc., on the Cleveland-Pittsburgh air mail route.

## CLEVELAND AIR NEWS

By M. Mirvis

**ALVA BRADLEY** has been named president of the Cleveland National Air Race & Show Corp., to succeed David S. Ingalls, resigned, who has left Cleveland to become Assistant Secretary of the Navy in charge of aviation.

Mr. Bradley is president of the Cleveland Baseball Club, chairman of the board of the Cleveland Builders Supply & Brick Co., and a director of the Midland Bank. The 1929 National Air Races and Aeronautical Exposition will take place at Cleveland Airport and Public Hall August 24 to September 2.

Clifford Henderson, of Los Angeles, will arrive in Cleveland this month to take over his duties as manager for the races.

**THE** Austin Company of Cleveland has received the \$200,000 contract for plant expansion of the Boeing Airplane Co., Seattle, Wash., according to G. A. Bryant, Jr., vice president of the former firm.

**THE** Cleveland Institute of Aviation has opened classrooms in the Society for Savings Building. Capt. Fred L. Smith, formerly chief instructor of the Air Corps Technical School at Kelly Field, Texas, is in charge of enrollment.

**NEW** officers of the Cleveland Glider Club are as follows: H. E. Dungan of Dungan Airways, Inc., president; O. F. Horn, vice president; E. T. Pachasa of Cleveland Model & Supply Co., secretary; and E. A. Smith, of Thompson Aeronautical Corp., treasurer.

**THE** John S. King Advertising Agency has added a Stinson plane to its transportation facilities for contacting accounts at remote places. John King, president, and John E. Wiley, vice president, are making regular use of the plane.



Captain Holden C. Richardson

**CAPTAIN HOLDEN C. RICHARDSON**, former chief of the design division of the Bureau of Aeronautics, Navy Department, has joined the Great Lakes Aircraft Corporation of Cleveland as vice-president in charge of engineering and design. Captain Richardson was a pilot of one of the Navy's N. C. boats, which were the first to fly across the Atlantic. He is widely known for his achievements in the design of airplane floats, hulls, and catapult launching devices. A graduate of the Naval Academy, Captain Richardson has been actively engaged in aeronautical work since 1912.

**AN** aviation school, air taxi service and airplane sales agency will be conducted by the Lorain Airway Service, Inc., at Lorain, 30 miles from here. Leland M. Mills, and R. W. Mills have organized the company. Port Mills will be the name of their airport on Leavitt Road.

**W. KING WHITE**, president of the Cleveland Tractor Co., is the first local Moth owner in this territory. Mr. White purchased his plane at the New York Aviation Show. Skyways, Inc., of Ohio, is Cleveland distributor for Moth planes.

**A** NEW training and sports airplane of advanced design, with a nine-to-one safety factor, is being manufactured by the Great Lakes Aircraft Corporation of Cleveland.

The plane is a two-place open job with dual controls. It will be powered with the 95 horsepower Cirrus four-in-line air-cooled engine.

Designers of the machine are Captain Holden C. Richardson, U. S. N. retired, vice president in charge of engineering and design, and lately Chief of the Design Division, Bureau of Aeronautics, Navy Department; P. B. Rogers, assistant chief engineer and former chief of wing design for the Glenn L. Martin Company; and Charles W. Meyers, sales engineer and chief test pilot of the company who was largely responsible for the design of the Waco-10 sports model.

**THE** Greenville Aircraft Co. has been incorporated with 250 shares of no par stock. Incorporators are H. W. Palmer, Lowell Bayman and John A. McEowen.

**CHRISTENED** "Miss Great Lakes" the first commercial airplane manufactured by the Great Lakes Aircraft Corporation was recently finished at the company's plant at Cleveland. This six-passenger plane is one of the several models to be produced by the concern. The complete line will range from sport planes to airliners, according to Col. Benjamin F. Castle, president.

**WILLIAM ROBERT WILSON** of Detroit has been elected chairman of the board of directors of the Great Lakes Aircraft Corporation.

**A** LIGHTED model of a modern airport will be among the exhibits of the Austin Company, airport engineers and builders, at the Detroit All-American Aircraft Show April 6 to 14. Officers of the firm who will be present include W. J. Austin, W. E. Arthur, J. C. Prosser, A. F. Plant, G. A. Bryant.

**TEX LA GRONE** of Kansas City, distributor of Waco planes in Missouri and Kansas, recently bought a Sport Waco, powered with a J-5 Wright Whirlwind engine.

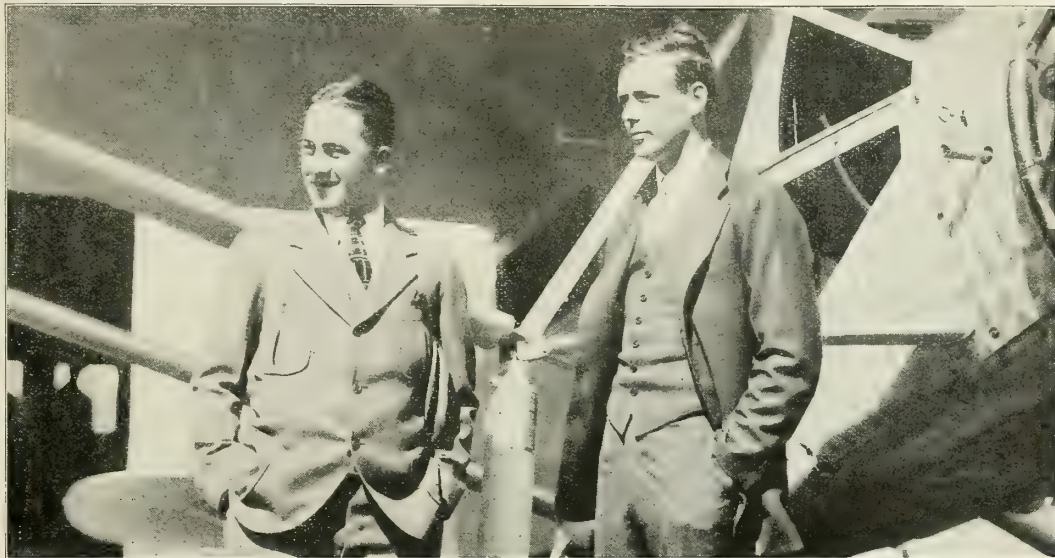
**AIR SERVICES, INC.**, of Akron, which is operating a flying school in conjunction with Akron University, will construct a hangar and machine shop at once at the Akron Municipal Airport. The educational advisory committee of the concern includes Dr. George F. Zook, president of Akron University; Fred E. Ayer, dean of the engineering school; and Paul W. Litchfield, president of the Goodyear Tire and Rubber Co.

The officers of Air Services, Inc., are: George W. Mertz, president; Herbert W. Maxson, vice president; Donald C. Mell, Secretary; and M. L. Freeman, treasurer.

**ON** April 1 the essay contest sponsored by the Embry-Riddle Company of Lunken Airport, Cincinnati, was closed. The subject was "Aviation in 1944." Ten prizes will be awarded for the best essays on the subject.

**WRIGHT VERMILYA**, former national guard and reserve flier, has been placed in charge of the Embry-Riddle Flying School at Lunken Airport, Cincinnati, Ohio. Mr. Vermilya will supervise all instruction and training methods among the instructors of the school.

**THE** Argo airplane, manufactured by the Alliance Aircraft Corp. at Alliance, Ohio, has been placed in production in the new plant of that firm, and will be exhibited at the Detroit All-American Aircraft Show. Both the engine and plane of this concern is manufactured in the company's factory.



Helping Lindbergh fly safely and surely—that's the mission of the ARMCO Ingot Iron gas tanks in this new Ryan Brougham, designed especially for America's Foremost Flyer.

## They fly protected and rest protected with "pure iron"

UP to the vaulted blue . . . with an ARMCO Ingot Iron gas tank protecting the precious fluid that speeds the airman safely and surely on his way.

Pure ARMCO Ingot Iron is ideally fitted for airplane gas tanks. It is made to last. Rust-promoting impurities are eliminated by special refining processes. When this durable iron goes into the tank there is every assurance of long, dependable performance.

Then, there is galvanized corrugated ARMCO Ingot Iron for hangar covering. Sturdy, rust-resistant, fire-proof . . . your planes are certain to be protected long from the elements when you house them beneath "the iron that's made pure to endure."

Wherever sheet metal enters into plane or port equipment, you can save money and insure complete protection for your planes with ARMCO Ingot Iron.

Ask the office nearest you to tell you the rest of this interesting ARMCO Ingot Iron Story.

### THE AMERICAN ROLLING MILL COMPANY

Executive Offices, Middletown, Ohio

Export: The ARMCO International Corporation  
Cable Address—ARMCO, Middletown (O.)

#### District Offices

Chicago  
Cincinnati  
Cleveland

Detroit  
New York  
Philadelphia

Pittsburgh  
St. Louis  
San Francisco



This IDECO Standard Metal Hangar will long shelter the planes that are housed at the S.K.F. Air Service Field, Lansing, Michigan . . . It is covered with rust-resisting ARMCO Ingot Iron for lasting, low-cost weather protection.



**ARMCO**  
INGOT IRON  
RESISTS RUST



## COLUMBUS AIR NEWS

By W. DONALD WALTER

**L**IEUT. WALTER AVERY has resigned his position with the Department of Commerce. He is now associated with Curtiss Flying Service, as a division manager. For the past year, Lieutenant Avery has been engaged in airway extension work for the Department of Commerce. Avery is well known to members of the pursuit squadrons which saw active service on the western front during the war. His many friends, both in the Air Corps and in civil life, will be glad to learn of his new connection. We wish him luck with Curtiss.

**T**HE Ohio State School of Aeronautics is enrolling a number of student pilots. Both flying and ground courses are offered at this school.

The school has exclusive rights in this locality to the Rankin System of instruction. Curtiss-Robins will be used largely for instruction, but each student will also have training on other monoplanes and on biplanes, both open and cabin types.

**T**HE city council has approved the lease of two hangar sites on the new municipal airport to Transcontinental Air Transport, Inc. Work is expected to be begun immediately on the construction of the hangars. It is planned to have all hangars erected on the field to conform to architectural plans specified by the city.

Several other commercial operators have

requested information regarding the leasing of hangar sites. Among these, it is understood, are United States Air Lines, Dungan Air Lines, Universal Aviation Corporation, and Seaboard Air Lines. United States Air Lines expects to operate daily passenger service between Cincinnati and Cleveland. Present plans contemplate the operation of two ships each way daily.

**T**HE Aero Club of Columbus has resumed its ground school instruction and is holding meetings each Wednesday evening in the Chamber of Commerce Building. From personal experience, we know that these weekly lectures are doing a great deal to further the air-mindedness of numbers of Columbus men.

The meetings last year were conducted by Lieut. Frank M. McKee, Air Corps. Mac is at present in Washington in the Chief's office, and the lectures are now in charge of Lieut. Fred Davis, Air Corps Reserve, who is proving himself an able successor to Lieut. McKee. Davis is chief pilot of the Columbus Flying Service.

**A**N ordinance granting a franchise to the Curtiss Flying Service for the operation of a flying school at the municipal airport is under consideration by the city council.

It seems probable that this franchise will be granted. We feel sure that air-minded citizens of Columbus would regard such an organization as Curtiss Flying Service as a distinct asset to this city.

**T**HE Norton Flying Club has been formed by local aviation enthusiasts for the purpose of obtaining flying instruction and making available to its members an opportunity to obtain the flying time necessary for the various grades of pilots' licenses.

**R**ECENT Army orders indicate the assignment to this corps area, for duty with the Organized Reserves, of Major H. S. Martin, Air Corps; Major Leslie MacDill, Air Corps; and Capt. F. E. Galloway, Air Corps.

It seems probable that these assignments are in connection with the Air Corps maneuvers to be held in May at Norton Field, Columbus, and Wright Field, Dayton. The detailing of these officers to the Organized Reserves seems to indicate that some of our reserve officers will see active duty in connection with the maneuvers. If this should be the case, it would be a splendid opportunity for these reserve officers to participate in missions in service type ships, and to familiarize themselves with the latest Air Corps developments in tactics, strategy, and materiel.

**M**AJOR MUEHLENBERG, the newly assigned corps area air officer, has reported at Fort Hayes for duty. As successor to the late Lieutenant-Colonel Seth Cook, Major Muehlenberg will have charge of all Air Corps activities in this area. We feel confident that he will learn to like Columbus.

(Continued on next page)

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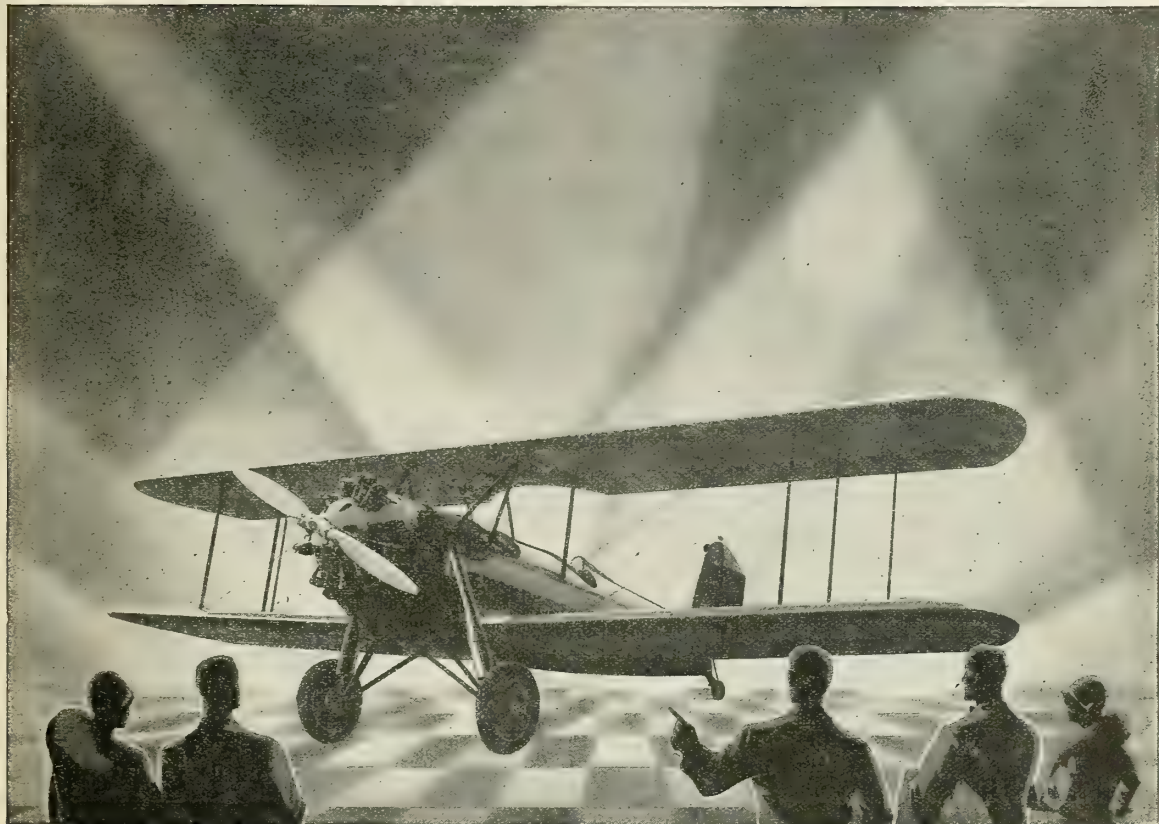
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# THE SPARTAN<sup>TM</sup>

## *Challenger*

Re-created and refined for the sake of beauty, utility and convenience, but retaining its supreme stability, the New Spartan C-3—Challenger powered—comes to the Detroit show a distinct factor in the light commercial plane field.



Standard equipment includes: Streamlined Oteo landing gear struts, 30x5 Bendix wheels and internal brakes, booster magneto, compass, air speed and bank and turn indicators, Hamilton steel propeller and 10x3 inflated tail wheel.

An attractive dealer proposition is now open.

**SPARTAN AIRCRAFT COMPANY**  
TULSA, OKLA.



(Columbus Air News continued)

**R**ESERVE activities in Columbus have been considerably handicapped during the past three months. We have gasoline, oil, ships and the inclination, but it appears that the time allotted for inactive flying in this area has already been exceeded. Unless we obtain some hoped-for relief, it seems likely that barracks flying will be the only variety indulged in by local reserve pilots until the beginning of the next fiscal year.

## CHICAGO AIR NEWS

By DUKE JORDAN

**A** PERMIT has been granted by Harbor Master C. J. Agnew for Chicago's first airport for amphibians and seaplanes to be located in the harbor waters around Navy Pier. The aquatic landing field area, half a mile long and 400 feet wide, is protected by a circle of breakwaters.

**A** SCHEDULE calling for the production of 60 airplanes during 1929 as compared with twenty-three last year has been mapped out by the E. M. Laird Airplane Co. The sixty ships will consist of the standard Laird three-seater open biplanes and a number of clipped wing sport types powered with the new 300 horsepower Wright Whirlwind J-6 engines.

**L**IEUT. SIDNEY A. PIERSON, assistant adjutant of Chicago's American Legion Aviation Post No. 651, is now affiliated with the Fairchild company's Chicago office.

**S**HIPS are already being housed in the National Air Transport's new hangar which is rapidly nearing completion at the municipal airport.

**J**ACK OATES is having cinders laid at his Westchester Airport, near Hillside, in preparation for spring business. He, with Jerry Webber, is kept busy during the week demonstrating Eaglerocks. Oates is also conducting a question and answer column once each week in the *Chicago Daily Journal*.

**B**ILL LOWRY exhibited the new Arrow Sport biplane here at the Hotel Sherman and at the municipal airport. He offered \$2,500 to any pilot who could spin the little ship.

**F**ENGER HIGH SCHOOL aviation students are working on two ships donated to the school by National Air Transport. Julian Sykes is in charge of the aviation ground school work.

**V**. A. JACKSON, formerly of Great Lakes Naval Training Station, is now in charge of Universal's motor overhauling department.

**C**HARLES E. BEARD is the new manager of the Air Passenger Bureau in the Palmer House arcade which is maintained by the Chicago Air Traffic Association, composed of air mail operators out of Chicago.

**H**ARLEY MITCHELL is chairman of the Chicago Association of Commerce's new aviation division.

**G**EORGE R. MYERS, formerly chief pilot and superintendent of operations for Interstate Airlines, has returned to the flying line with Boeing. Myers, a former high school principal, shortly after his return to the Boeing ranks helped to set a record between here and San Francisco.

**R**OBERT WOOD is the new aviation editor for the *Chicago Tribune*. With the *Tribune's* establishment of an aviation section, almost every Chicago paper has a regular aviation department. Cloyce Hamilton is aviation editor on the *Daily News*; Capt. Homer Barry, on the *Herald Examiner*; and Duke Jordan, on the *Daily Journal*.

**L**IEUT. Commander Paul E. Gillespie, commanding officer at the Great Lakes Naval Aviation Station, has resigned from the service to become director of flying schools for the Universal Aviation Corp., according to Commander Willis B. Haviland, school director of Universal Aviation. In this position he will have charge of all courses in the various schools of the corporation.

Lieutenant Commander Gillespie flew during the last war, and participated in the bombing tests of 1920 when the battleships *Iowa* and *Ostfriesland* were sunk. He has been in command of the Great Lakes station for the past three years.

**U**NIVERSAL Air Lines have opened a passenger office in Dallas, Texas, to aid in the handling of the air-rail traffic which it operates with the Chicago Great Western Railroad. Henry E. Bulla will have charge of the office.

**T**HE Rand McNally standard indexed maps with Air Trails comprise a new and augmented edition of Rand McNally state pocket maps, designed for use by pilots in flight. The new series covers the entire country by states, and gives established airways, all airports and improved landing fields, all beacons, radio beacons, and other aids to air navigation, magnetic declination, elevations, and the relative mass of cities.

**C**OMPLETE service equipment for the repair and calibration of Pioneer airplane instruments is being installed in the hangar of the Universal Aviation Corporation at Cicero Field, Chicago, by the Pioneer Instrument Co., of Brooklyn, N. Y. Similar service will be installed for the overhaul of Pratt and Whitney engines.

**T**HIRTY trimotor airliners, ranging from twelve to thirty-two passenger capacity, will comprise the air fleet of the Universal Aviation Corporation as soon as the planes can be obtained, according to plans recently announced by officers of the corporation. These airliners will be of the convertible parlor car and pullman type ships.

Six trimotor planes are now in operation on the lines of Universal Aviation, and

nine more are soon to be delivered. Fokker F-10 and Ford trimotors will be among the new planes ordered.

**J**OSEPH F. READ, transport pilot and the first flier to install brakes on an airplane, has accepted the managership of the new and used airplane sales department of the Universal Aviation Corporation. Mr. Read will be located at St. Louis.

**G**REER AIRWAYS, a subsidiary of Greer College, Chicago, has enrolled 261 students in its aviation course since January 1, according to J. C. Bryan, superintendent of flight and ground instruction.

Greer Airways occupies a four-story building entirely devoted to air training. Among the specialized aeronautic courses given in the school are: radio, machine shop practice, acetylene and electric welding, pontoon repair and construction, and the theory of operation, installation and repair of instruments.

**V**. A. JACKSON, formerly aviation chief motor mechanic of the United States Navy, stationed at the Great Lakes Naval Base, has joined the Universal Aviation Corporation to take charge of engine overhauling and instruments on its Fokker F-10's. Mr. Jackson has had eight years of motor overhauling in the Navy.

**U**NIVERSAL Aviation Corporation is replacing all water-cooled airplane engines in its system with air-cooled power plants.

**T**HE Edgewater Flying Club, a corporation formed February 1 as a non-profit organization, is constructing planes in which the training of its members will start in the spring. Monoplanes and biplanes, fitted for land or water, will be constructed by the club. The officers of the club include H. E. Rennacker, president; George K. Spanier, vice president and secretary, and Maurice Tartas, treasurer.

**C**OMBINATION air and rail tickets, combining the service of the Chicago Great Western Railroad and the Universal Airlines, have been placed on sale at the offices of both organizations.

## ILLINOIS AIR NEWS

**C**URTISS Flying Services, Inc., recently acquired the Campbell-De Schepper Airplane Corporation of Moline, Ill., operators of the Moline Airport, as a further addition to its chain of airports and airfields.

**T**HANKING the Illinois state senate in behalf of the members of the aeronautical industry for their action on the airport bill, Capt. George J. Brew of Universal Air Lines invited the members of the senate and their wives to a flight over the state capital recently. Those who accepted the invitation included Senators Florence Bohrer, Barbour, Cuthbertson and wife, Jewell, Lee and wife, Leonardo, Mendel, Meyers, Michel, Mills, Smith and wife, and Thompson and wife.

# The SCHOOL of SUCCESS Where You LEARN to EARN



Qualify yourself for the rich remunerations offered today by commerce in the sky. Big Business is commandeering manpower, airworthy and exactly tested, to carry on its work. Consolidated Air College equips you for advancement to a major role in practical aeronautics.

Learn to fly in safe equipment—only the most modern airplanes are used; American Eagle Biplanes, Cessna Monoplanes, Monocoupes, and Ryan Monoplanes. Fly ships powered with the famous Wright Motors. Learn the theory of flight, practical flying, motor overhauling, construction and installation, structures and rigging, navigation, meteorology, etc. A new course in parachutes now added.

All students are instructed with the nationally known RANKIN SYSTEM OF TEACHING. This system gives finest results known. Consolidated Air College produces pilots able to step into high paying positions. You actually learn to earn here.

Make up your mind to get full information about Consolidated Air College. Sign and mail the coupon for literature describing different courses including ground school course, combination ground and flying course, commercial pilots' course, transport pilots' course and also new home study course.

WILLIAM A. ONG,  
*Vice-President and General Manager.*

## CONSOLIDATED AIR COLLEGE

KANSAS CITY, MISSOURI

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## ST. LOUIS AIR NEWS

By A. W. LEAGUE

**T**HE new WIL Airport, which occupies 186 acres directly north of Granite City, is to be completely developed. Present plans call for six hard surfaced runways. Lights for night flying are to be installed, and two large hangars are to be constructed. A new flying school building, which will house the ground school, is to be erected this spring. A flying course consisting of 55 hours flying time and 12 weeks ground school will be given. WIL Airport is owned and operated by the operators of the radio station of the same designation in St. Louis. Jack Burson is field manager.

**A** LINE of open cockpit biplanes, to supplement the cabin monoplanes now manufactured by the Parks Aircraft, Inc., at the Parks Airport, was announced recently by the officials of the company. The biplanes, designated Parks P-1 and Parks P-2, seat two passengers and a pilot. The P-1, powered with an OX-5 motor, has a top speed of 102 miles per hour, and a landing speed of 34 miles per hour. The P-2, powered with an Axelson motor of 150 horsepower, has a top speed of 120 miles per hour. The company will also continue to manufacture the Parks P-3, a six-place cabin monoplane formerly called the Parks Arrow. All three types of ships will be exhibited at the Detroit All-American Aircraft Show. Construction of an addition to the factory has already been started. The new building is of brick and steel construction and will be used for painting and doping airplanes. It is 100 feet long and 80 feet wide. The new structure will cost approximately \$30,000.

**A** BRICK hotel for students and airport personnel is now nearing completion at the Parks Airport. A contract has also been let for the construction of a new administration building. All of the old wooden structures are being replaced by modern structures of brick and steel construction, and when the present improvement and expansion program, outlined by the Parks organization, has been completed, Parks Airport will be one of the most modern privately owned airports in the country.

**T**HE organization of the Allied Aviation Industries Inc., with headquarters in St. Louis, as holding company for airplane manufacturing and accessories companies has been announced by the investment firms of Love, Bryan & Co., and Augustine & Co. of St. Louis. The company owns all of the Lambert Airport Corp., the Aviation Accessories Corp., and the Hurricane Aircraft Engine Corp. and also proposes to acquire shares in other concerns. Lambert Aircraft Corp. was organized recently to take over the Mono Aircraft Company, which makes the Monocoach, Monoprep and Monocoupe. Hurricane Aircraft Engine Corp. has taken over the aircraft engine department of the Velie Motor Company. Aviation Accessories Corp. was organized to deal in airplane ac-

cessories. It is planned to move the factories of the Lambert Aircraft Corp. and the Hurricane Aircraft Engine Company to St. Louis from Moline, Ill., where they are now located. This will bring the total of airplane manufacturing concerns in the St. Louis district to seven. The seven concerns manufacture fourteen different types of planes and two motors.

**T**HE first of five trimotor planes to be placed in passenger service between St. Louis and Fort Worth, Texas, has been delivered. The line is operated by Southwestern Air Fast Express. It will make various rail connections, and stops will include Fort Worth, Dallas, Oklahoma City, Tulsa, with a flag stop at Springfield, Missouri. Bob Cantwell is chief pilot for the concern. B. Russell Shaw, local airport designer, has been appointed architect for buildings for the concern.

**A** TEMPORARY lighting system is now in use at Lambert Field. The system comprises 25 - 100 candlepower boundary lights. Red hazard lights are located on factory buildings, hangars and other obstacles. An illuminated wind cone on top of the National Guard hangars indicates the direction of the wind.

**A** NOTHER new aviation company in St. Louis has been organized by Frank H. Robertson, former president of the Robertson Aircraft Corp., and his brother Maj. Wm. B. Robertson, president of Curtiss-Robertson company. The new concern, which is owned exclusively by the Robertsons, will supply service facilities and hangar space for planes visiting Lambert St. Louis Field. A double steel hangar formerly occupied by the Robertson Aircraft Corp., has been leased from the city as a service station. The hangar will be rebuilt, with brick walls and concrete floors and the company plans to be in operation in a few weeks.

**C**APT. H. E. HONEYWELL, veteran St. Louis balloonist, has been waiting for fair weather to make several trial flights in preparation for the national elimination balloon race for the Litchfield Trophy to be held from Pittsburgh, Penn., May 4th. Capt. Honeywell will enter a balloon of 35,000 cubic foot capacity in the event.

**D**ETAILS of the new program of the Bureau of Navigation for the development of naval aviation among St. Louisians have been made public. The instruction, so far as is practicable, is to be identical with that given to aviation pilots of the regular Navy. The preliminary ground school work and elimination flying are to be provided at Lambert Field by the local Naval Reserve aviation squadron. The second stage of this course is primary and advanced flying at the Pensacola, Naval Air Station and the final stage is one year's active duty in the aircraft squadrons of the Navy battle or scouting fleets as commissioned officers of the Naval Reserve.

**F**IFTEEN business concerns in St. Louis have established "sign posts" for aviators by painting airplane indicators on the roofs of their buildings, as a result of a campaign begun a year ago by the Chamber of Commerce.

**T**HE Mahoney-Ryan Aircraft Corp., recently delivered to S. L. (Casey) Lambert a Ryan six-place cabin monoplane with special interior and exterior finish. The upholstery is wine red mohair, with the exception of the pilot's seat, which is upholstered in red leather. Silk curtains, to match the portiere curtains at the rear, adorn the windows. The instrument board and all metal parts are finished in wine red. The fuselage is of French Gray trimmed in red, and the wing is finished in silver.

**J**OHAN L. CAMPION, war-time flier, has been appointed Eastern factory representative for Mahoney corporation. G. A. (Buddy) Jones covers the Central states, and Ted Schlueter has been appointed factory representative on the West Coast.

**T**HE latest air route through St. Louis is to be combined plane-motor bus system, to be operated by the Pickwick Stage System. For a time, St. Louis will be the eastern terminal of the proposed route, but plans call for an extension of the service on to New York later. Passengers will leave Los Angeles in the evening and will sleep in a Pickwick "Nite Coach," and arrive at the Phoenix, Arizona, airport the next morning. The air journey to St. Louis will be completed that day. The service will be started April 1st, the Pickwick company has announced.

**M.** L. ERICKSON and F. R. Robinson, of the Aeronautics Branch of the Department of Commerce, are stationed at Lambert Field to superintend the installation of the new radio station. The station and tower will be erected at the extreme southeast corner of the airport, well out of the way of planes coming in for landings or taking off. Weather reports and other data necessary to air travel will be sent direct to the operating companies at the field and in the surrounding district over a direct telephone and ticker system.

**A** BILL authorizing Missouri cities of the fourth class to vote bonds for the construction of airports or aviation landing fields has passed the House. The State of Missouri is not included on the honor roll of states with a large number of first class airports, but it will be, as it should be, when this bill is passed by the Senate.

**A** BILL to establish a permanent municipal airport commission composed of five city officials and five representative citizens to be appointed by the chairman of the body is pending before the St. Louis Board of Aldermen. The bill was introduced at the request of Director of Public Safety Salisbury, who will become chairman of the

(Continued on next page)



## I have no fear

**W**HEN the water widens to the dock, and bombastic little tugs pull my floating world away, I know that no whim of the salty deep sea gods can confuse my passage, for I recall a thousand other safe crossings by this gigantic liner and her stately sisters. ¶ When I toss my bag to a grinning porter, and great wheels flash their sparks from singing rails, the unheard rumble of a thousand other trains assures the safe arrival of this—their brother. ¶ When my fingers tighten on the wheel and the speedometer rushes up to 70, I fear no flurry of riven parts, for the wind whistles back the message that a million others have done—and do—the same. ¶ And when I venture into the air, or watch those I love and cherish slip up toward the stars, the knowledge that the engine bears the name of Continental and is bred of a line that has been synonymous with dependability for upwards of a quarter century, that knowledge, I say, stills the rush of the winds and dwarfs into insignificance the vast, vacant spaces below—and I have no fear.

Continental Motors Corporation, Aeronautical Division, *Office and Factory:* Detroit, Mich., U. S. A.

# ***Continental Motors***

THE LARGEST EXCLUSIVE MOTOR MANUFACTURER IN THE WORLD



(St. Louis Air News continued)

permanent commission. The measure also provides for the employment of a field superintendent, an assistant superintendent, a clerk, a foreman, laborers, janitors, three guards and an electrician. Preliminary surveys preparatory to draining the municipal airport at Bridgeton are being made by William Stoecker, who has been retained by the city as field engineer.

**WORK** on the joint Transcontinental Air Transport and Curtiss Flying Service airport, near East St. Louis, has been started under the direction of Pres Sultan and Phil Love, air consultants for Transcontinental Air Transport. The airport, comprising 500 acres, is owned by St. Louis Air Terminals Corp., which is headed by Mark Steinberg. Plans for an administration building, hangars, runways, and roads costing \$500,000 are being prepared by Love-Sultan, Inc. The airport will be opened in about three months.

**THE** latest shipment of OX-5 motors consisting of three car loads recently was sent to the Robertson machine shops by the Curtiss Aeroplane and Motor Company. The Robertson Motor Overhauling Company has invested \$20,000 in machinery for the overhauling of water-cooled motors, and an additional \$5,000 for a complete shop for air-cooled motors. The Robertson overhauling division is equipped to produce any part of an airplane, without having to send to the manufacturer for material or parts.

**A** NIGHT school for aviation mechanics has been established by the Robertson Flying School, under the supervision of Paul Paine. The course, which will cover ten weeks of instruction, will include such subjects as rigging, wires and splicing, airplane and engine repair, theory of flight, fabrics and repair, woodworking, engine action and trouble shooting.

**THE** new passenger depot and flying school building of the Robertson Aircraft Corporation was opened recently. The structure, situated between two hangars on the west side of the field, contains waiting room and ticket office, operations office and class rooms, a pilots' room, shower bath and toilet facilities. The structure is of brick and steel, and with the new air mail hangar, represents an investment of \$65,000.

**THE** Cardinal, a two-place cabin monoplane manufactured by the St. Louis Aircraft Corp., has just completed its first sales tour. Plans for establishing distributors for the ship are being made. Production of the Cardinal is under way, and a second model will be exhibited at the Detroit aero show. An assembly plant 80 by 120 feet will be established at Lambert Field.

**THE** concrete foundations for the new student barracks of the Von Hoffmann Flying School have been poured, and the structure will probably be ready for occupancy in thirty days. Work on an administration building and a hangar will be started immediately.

**THE** East St. Louis Aeronautical Commission has started work with plans to mark the city for the benefit of aviators. The city is being surveyed for suitable sites on which to display the name of the city and arrows pointing to Parks Airport.

**A** CHAPTER of the National Aeronautic Association has been organized at the Parks Airport with 78 charter members. Clyde Brayton was elected president; Edgar Schmid, vice president; Fred Fisher, treasurer; F. X. Cox, secretary; and Henry Schnittinger, sergeant-at-arms.

#### A.S.M.E. Aeronautical Meeting

**S**IMULTANEOUSLY with the Gardner Cup races to be held in St. Louis in May, the third national aeronautical meeting of the American Society of Mechanical Engineers will convene in St. Louis. Gifts and honors will be given by the society to the twelve persons who have made outstanding contributions to aviation since Lindbergh's flight.

The program of the A. S. M. E. calls for forty-two papers on the following subjects: structural analysis, pilot and flight training engines, air transport, lighter-than-air craft, problems of flying, and airports and aircraft instruments.

**FLYING** and ground courses at W-I-L School, Inc., St. Louis, have been lengthened with no increase in the cost of tuition, according to J. I. Burson, manager of the school. The commercial course now consists of sixty-five hours of flying and a twelve weeks' ground course.

#### Robertson Leaves Universal

**L**IEUT. FRANK H. ROBERTSON, chief of operations for the Universal Aviation Corporation, resigned his post on April 1, to follow other aviation activities in St. Louis. Lieut. Robertson was head of the Robertson aviation interests of St. Louis, since purchased by Universal Aviation, and worked with the buying firm while consolidation was being effected.

**R**ACES for small airplanes, a spot landing contest, and other exhibitions will entertain spectators at St. Louis while the final phase of the Gardner Annual Trophy Race is in progress on May 30. The program of entertainment is being arranged by the race officials in cooperation with the St. Louis Chamber of Commerce. The final race will consist of a flight to Indianapolis and return, turning a pylon over the Indianapolis speedway.

**L**IEUT. A. A. YOTZ has been appointed chief instructor of the ground school of the Guardian Air College. He is a graduate of Brooks and Scott Fields. He was formerly chief pilot for the Southern Airways at Stinson Field and instructor in the ground school at Parks Air College.

William E. Barrett, formerly southwestern advertising manager for the Westinghouse Electric & Mfg. Co., has been named publicity counsel for the Guardian Aircraft Corporation.

**C**ONSTRUCTION was started recently on a new building at Parks Air College, south of East St. Louis, for the school of airplane and engine mechanics. The new building will be 125 feet by 180 feet, and will be equipped with machinery to build airplanes, and with modern airplane power plants.

**THE** contest of the W-I-L Airschool, Inc., for a fitting slogan for its flying school closed March 31. With the selection of the slogan, a prize of a complete flying and ground course, valued at \$450, will be awarded the winner.

#### KANSAS CITY AIR NEWS

By H. H. James

**A**N aviation class exclusively for women is being organized. Five women and girls already have enrolled. The instructions will be given under a special contract with the Bennett Airways, Inc.

**THE** Western Air Express will start operation on May 1 with Kansas City as a key city. The announcement was made here by James G. Woolley, vice president of the company, after a conference with city officials and Lou E. Holland, executive manager of the chamber of commerce. The company will use the municipal airport. The line will operate between Kansas City and Los Angeles on a 13-hour schedule, with the return schedule requiring 11 hours. The fare, while not definitely decided on, will be about \$175. Eight Fokker F-10s will be used in the service between the two cities.

**THE** Central Air Lines, with headquarters in Wichita, Kans., is to operate a passenger air service between Wichita and Tulsa, Okla., and between Wichita and Kansas City. The company also is considering extending its service to Omaha, Nebr.

**THE** Porterfield Flying School, a subsidiary of the American Eagle Aircraft Corp., announces the appointment of A. O. Hughes as sales manager of the school. Mr. Hughes comes to Kansas City from the Bay State Flying Service, Boston.

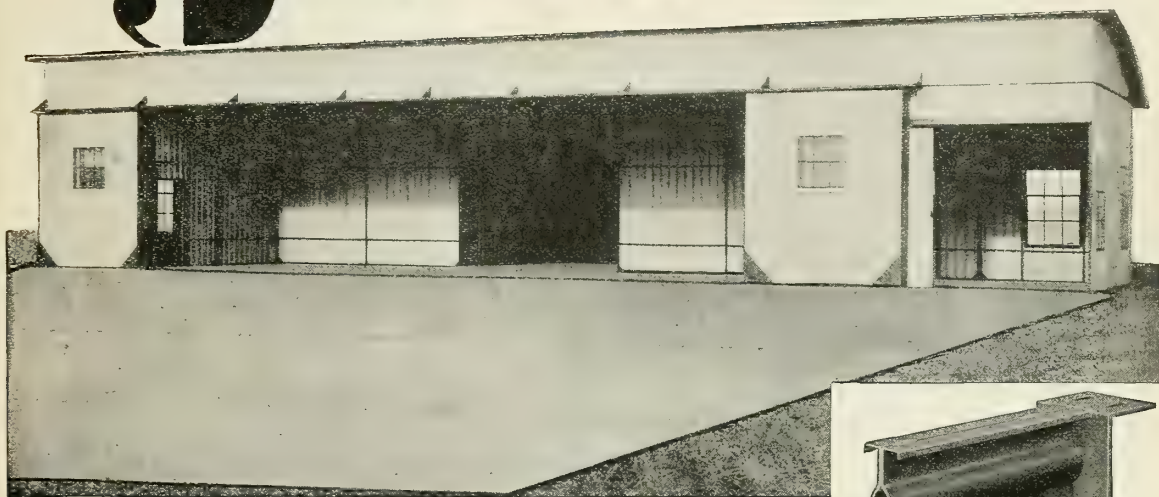
**THE** Butler Aircraft Corp. has developed a new airplane known as the Black Hawk. The company, which is a subsidiary of the Butler Manufacturing Company, built its first plane a few months ago. Tests of this plane proved it to be very successful, but certain changes were decided on. The new machine is a biplane, designed for use either in mail or passenger service. It is powered with a Wright Whirlwind engine and has a cruising speed of 100 miles per hour. Waverley Stearman, the company's engineer, designed the plane.

**DEWEY BONEBRAKE**, aeronautical engineer here, has designed a glider plane, initial test flights of which have proved very satisfactory.

(Continued on next page)

# 3 IN ONE

Photo is of Dr. Walter Cross' 3 in one Butler Ready Made Hangar. Dr. Cross is a nationally prominent chemist using his plane between his various testing laboratories.



## INDIVIDUAL HANGAR MOTOR CAR GARAGE PRIVATE OFFICE OR CLUB ROOM



MODELS IN PRODUCTION  
Three place open. Four place cabin.

POWER UNITS  
Designed for installation of J-5 AB Wright Whirlwind, 200 H.P. motor. Other power units may be installed.

LOADING  
Normal pay load, two passengers and baggage, 400 to 500 pounds. Gross weight 2650 lbs. Power loading (J-5 AB) 13.25 lbs. per H.P. Wing loading 8.06 lbs. per sq. ft.

DIMENSIONS  
Wing span—upper 34 ft., lower 30 ft. Total wing area 310 sq. ft. Overall length 24 ft. 6 in. Maximum height 10 ft. Wheel tread 7 ft. 6 in.

PERFORMANCE DATA  
(Conservative with full load)  
Maximum speed 130 M.P.H. Landing speed 42 M.P.H. Rate of climb at sea level 1400 ft. per min. Service ceiling 14,000 ft. Cruising speed 1600 R.P.M. 110 M.P.H.

FUEL DATA  
Gasoline capacity upper wing 40 gal., fuselage 30 gal., total 70 gallons. Gravity feed through 1/2-inch lines. Oil capacity 8 gallons.

BUTLER AIRCRAFT CORPORATION  
KANSAS CITY, MO.



FOR your motor car while you are flying—for your ship while you are motoring—for all three of you between times—here is protection against the elements—against fire—against tampering. It is truly a home port all your own.

Roll back the steel doors and it is only a matter of moments to get going on the highway or into the air. Plenty of room for tools in the garage and the third compartment is variously utilized for office, club room or tool room. An ideal air station for transport lines.

Butler Ready Made Hangars are quickly erected and may be taken down unit by unit for moving to new locations without danger or loss of anything more than a few dropped bolts. Yet permanency is one of their out-standing characteristics. Sizes range from the smallest individual type to the enormous airport types, which are familiar landmarks at many landing fields. Hangar Booklet 75 and Butler engineering service will supply you with all the additional information you need—including prices, if you will mention the size building needed.

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In Butler Ready Made Industrial buildings the structural purlins are a combination of tubular and I-beam design, giving the maximum strength attainable per pound of steel.

In all Butler Ready Made buildings, the galvanized steel wall and roof sections are stiffened with deeply drawn corrugations, on 8-inch centers, giving a neat paneled effect.

# BUTLER

## READY-MADE HANGARS



(Kansas City Air News continued)

**RUTH HAVILAND**, the first Kansas City woman to be granted a pilot's license, was recently married to Dale Seitz. She is the official hostess at the Fairfax Airport, having been appointed to that place by the Woods Brothers Corporation.

**ROBERT F. BURTT**, who has been in charge of the aviation bureau of the chamber of commerce, has resigned that position to become the Middle West sales representative of the Curtiss Flying Service.

**BRIEF** funeral services were held here March 4 for Mrs. Henry Haskell, sister of Orville and Wilbur Wright, the airplane inventors, who died here the day previous. The body was taken to Dayton, O., for burial. Orville Wright and another brother, Lorin, both of Dayton, were here when their sister died. She was the wife of the editor of the *Kansas City Star*.

**E. E. PORTERFIELD, JR.**, president of the American Eagle Aircraft Corporation, has announced that the company will exhibit two planes at the Buffalo, Pittsburgh and Detroit aviation shows.

**A** GLIDER club, known as the Kansas City Glider Club, has been organized here. There is a large interest in gliding as sport here, and the membership in the club is growing rapidly.

**COMPLETE** construction plans for the development of Fairfax Airport, involving an initial expenditure of \$400,000, have been announced by the owner, Fairfax Airport Co., a subsidiary of Wood's Brothers Corporation. Landscaping will amount to \$15,000. The 1929 construction program was to begin April 1.

The plans call for a long row of buildings in the form of a V along the wings of the southwest corner of the field, and near the bordering highways. Concrete aprons 40 feet wide and 5,000 feet long will be laid in front of these buildings, and eight fueling pits will be distributed over this area. The buildings called for in the plans include: administration buildings, four sales and service buildings, transport, commercial, and private hangars, office and lunch room, four hangars with classrooms for the Curtiss Flying Service, and new quarters for the Porterfield Flying Service.

**R. P. RICE**, Kansas City motor car dealer, is to become chairman of the board of the American Eagle Aircraft Corp., according to E. E. Porterfield, president. Mr. Rice will take an active part in the company's activities as advisor on financial and sales problems.

This addition is accessory to the million dollar expansion program of the American Eagle firm, involving the construction of a new factory at Fairfax Airport. The company has a schedule of 1,200 planes for this year, two-thirds of that number being already under contract.

**Curtiss Flying Service at Fairfax Airport**  
**FAIRFAX AIRPORT**, Kansas City, is to become an air base of the Curtiss Flying Service, Inc., with an immediate construction program of \$225,000, according to a recent announcement of Ray G. Sparks, Kansas City representative of the Service. The Woods Brothers Corporation, owner of the airport, also plan to invest about \$400,000 in the construction at the field of what will be virtually a small town, having restaurants, shops, and indoor and outdoor recreational facilities.

Instruction at the Curtiss flying school will include a complete ground school course, as well as flying training with the Curtiss training plane, the Fledgling.

The sales organization of the Curtiss Flying Service will be sole agents for all Curtiss planes, Sikorsky amphibians, Ireland flying boats and amphibians, Caproni land and water planes, and Cessna planes. The Curtiss motors handled here will include OX-5, Challenger D-12, Conqueror, and Chieftain.

A tract running along the west side of the field 800 by 190 feet will be the location of the Curtiss buildings. The primary construction program calls for the erection of two brick and steel hangars, and a dormitory for students. Each hangar will be 100 by 100 feet, and each will have a second story 22 feet wide, the entire length to be used as class rooms and offices.

**THE** Bennett Flying Schools of Kansas City recently moved into new and larger quarters in a 3-story-and-basement building. The remodelled building will house the Bennett Airways, Inc., the Bennett-Eaglerock Sales Co., distributor in eastern Missouri and Kansas for the Eaglerock plane, as well as the classrooms, offices and shops of the flying school.

The new quarters of the Bennett Flying Schools will be just five blocks from the Kansas City Municipal Airport, where students are given flying training.

**FAIRFAX AIRPORT** equipped itself for night flying in two and one-half hours recently when rain made a new landing field for the air mail pilots necessary. Notified at 3:30 of the danger to the night fliers, Woods Brothers had the unlighted field illuminated by 6 o'clock.

The light and power company was called, and responded with eighty men to lay an emergency power line. Floodlights were installed on the hangars, and torch pots lined the field.

**THE** American Eagle Aircraft Co. has started operations in its new factory at Fairfax Airport, Kansas City. The new plant consists of five buildings: a general factory 100 by 300 feet, two paint and dope buildings, an experimental laboratory structure, and an administration building. Production is starting on an open biplane, a four-place cabin monoplane, and a folding wing sport biplane. The production schedule calls for 1,200 planes this year, of which 800 are now ordered, according to E. E. Porterfield, Jr., president.

**BREDOUW-HILLIARD AEROMOTIVE CORPORATION**, the first airplane parts and supply house in Kansas City, now has a complete line of airplane parts and supplies in stock. Besides operating as an approved Wright parts and service station, and an authorized Nicholas-Beazley parts and supply depot, it is a distributor of other aircraft supplies. A standard oil filling station and shops for repair and overhaul of planes and motors are maintained at the municipal airport.

**WITH** the purchase of a 2½-acre factory site at Fairfax Airport, Kansas City, R. A. Rearwin is making plans for the production of the Ken-Royce biplane. A plant 100 feet by 300 feet will be built soon.

The Ken-Royce was designed by engineers for Mr. Rearwin. It is a three-place streamlined plane powered with a Curtiss Challenger engine.

Mr. Rearwin is a lumber dealer of Salina, Kansas. The plane is named for his two sons, Kenneth and Royce.

**THE** Porterfield Flying School now has an enrollment of 126 students, according to Capt. Leland A. Miller, manager of the school. Since the beginning of its student training in 1924 the organization has taught over 1,000 pilots and mechanics.

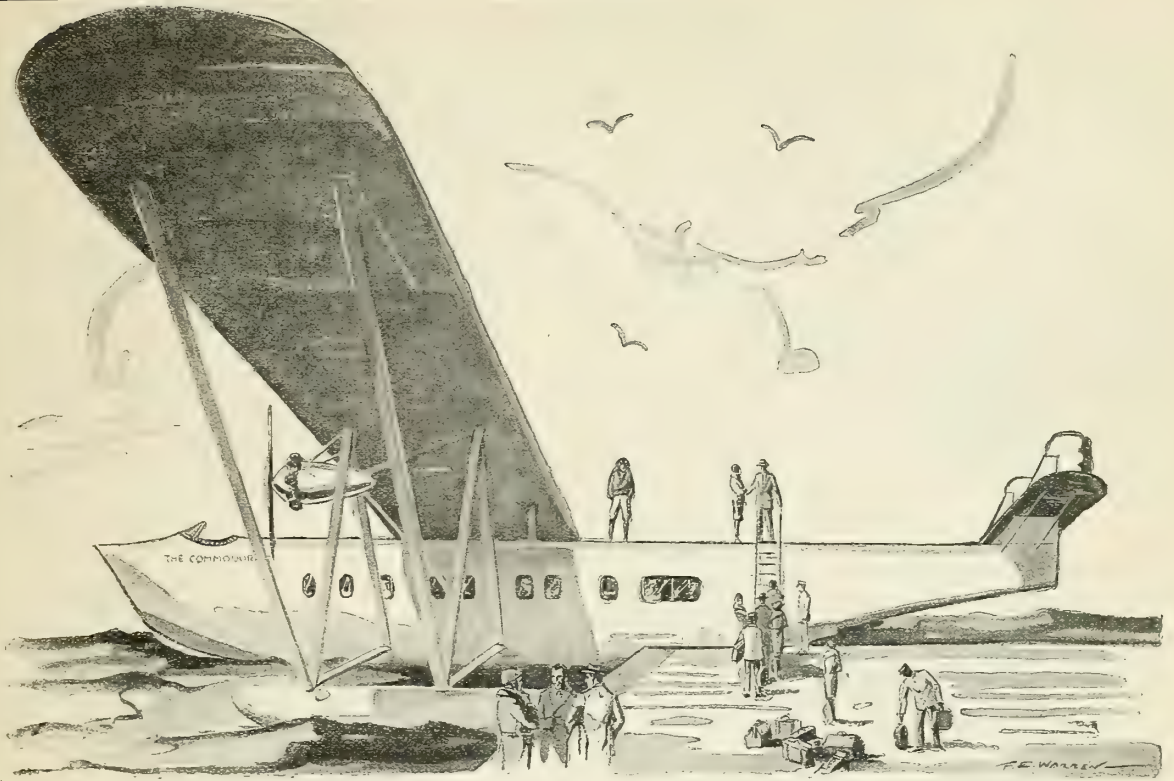
**HEADED** by a faculty engaged for the past four years in design and stress analysis for airplane manufacturers, the U. S. Aircraft Engineering School of Kansas City specializes exclusively in design and stress work involved in airplane production. In addition, there is a course for pilots consisting of navigation, meteorology, theory of design, theory of airplane motors, and glider work. Hugh L. Thompson, of the Thompson aeronautical Engineering Co., is head of the school.

**MONESSEN AERO CORPORATION** of Monessen, Pa., has been appointed distributor in western Pennsylvania for planes of the American Eagle Aircraft Co., of Kansas City.

Romkey Flying Service of Peoria, Ill., will serve as distributor for the American Eagle Aircraft Co., in central Illinois and southeastern Iowa, operating on ten-ship contracts in each state.

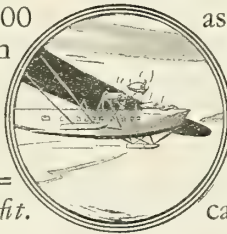
**O. E. SZEKELY**, president of the Szekely Aircraft Corp., Holland, Mich., recently tested the American Eagle Flyabout powered with a three-cylinder Szekely engine.

**MISS MILDRED KAUFFMAN**, 20-year-old Kansas City aviatrix, plans to make a solo flight in May in an effort to shatter the existing world's endurance record for women. She will pilot an American Eagle three-place open cockpit biplane powered with a Siemens-Halske radial motor of 125 horsepower. E. E. Porterfield, Jr., president of the American Eagle company, says his engineers are placing special fuel tanks in the machine.



## PAY-LOADS *that produce* PROFITS

A cargo of 600 pounds of mail and express + 32 passengers + 800 pounds of baggage + a pilot + an assistant pilot - mechanic + a steward + sufficient fuel to fly 300 miles at a cruising speed well over 100 miles an hour = *a pay-load that produces profit.*



The main cabin of The Commodore, as illustrated below, comprises five separate passenger compartments—a buffet and a wash room. The control cockpit is in the nose of the hull, connected to the main cabin by a door.

That, in brief, is exactly what a Consolidated Commodore flying boat, the sister-ship of the well-known Navy Patrol Plane XPY-1, will do for any transport operator whose service extends over a territory that, by topography and flying conditions, makes the use of flying boats desirable.

We will gladly furnish complete details and particulars pertaining to The Commodore's adaptability to air transport service wherever there is water—a comprehensive survey showing how The Commodore assures *pay-loads that produce profits* regularly and consistently

CONSOLIDATED • AIRCRAFT • CORPORATION • BUFFALO • NEW YORK

*The decorative scheme of the passenger compartments is optional. Seats are upholstered in mohair or velour to match the interior trim.*



# The COMMODORE



## MISSOURI AIR NEWS

**T**HE Nicholas-Beazley Airplane Company, Inc., of Marshall, has announced increase of its capital, increase of its number of directors from five to seven, and extension of its business purposes. The company was granted a certificate embracing these extensions. The capital of the company is increased from \$25,000 to \$1,500,000.

Extension of the business includes the manufacture of the Barling NB3 all-metal low-wing monoplane. Russell Nicholas is president, and Howard Beazley is secretary of the corporation.

**H**AROLD A. Speer, formerly vice president of the International Aircraft Co., of Cincinnati, has joined the Nicholas-Beazley Airplane Co., of Marshall, Mo., as Manager. Mr. Speer will handle the sales of the Barling NB-3 monoplane.

## WICHITA AIR NEWS

**T**HE Travel Air Manufacturing Company of Wichita, has approved the plan of retail sales submitted by the Commercial Credit Companies of Baltimore, Maryland, and has officially recommended it to all its dealers and distributors.

A number of the large automobile manufacturers now employ the Commercial Credit Companies plan.

Chas. W. Mitchell, Jr., a World War naval aviator and now manager of the airplane division of the Commercial Credit Companies, has been visiting all airplane manufacturing organizations throughout the country.

**A** FOURTH unit of the Travel Air Factory at Wichita is being completed to accommodate the increase in sales of Travel Air products. The new addition makes the total floor area of the Wichita plant 100,000 square feet.

The new addition is 75 by 275 feet. It aids production by permitting a steady flow of material from the other units into this for final assembly. Regular day and night shifts are operated, and over 400 men are employed in the factory.

**T**HE Braley School of Flying, Inc., is progressing rapidly with its expansion program. Several instructors have recently been added, and more are being negotiated for at this writing.

Harold Wynn, who has served as an instructor in several air schools of the United States, has joined the Braley school as a flying instructor.

S. B. Fishburne, of Columbia, S. C., is now teaching meteorology in the Braley school. He served four years in the navigation department of the naval reserve, and in 1927 was instructor of sciences at Riverside Military Academy, Gainesville, Ga.

**A**DDING to its original battery of Travel Air training planes, the Braley School of Flying, Inc., has purchased several new Swallow planes. The Braley school expects to buy several other planes.

**B**RALEY AIRPORT, in the California section at Wichita, was dedicated recently with the breaking of ground for the dormitory of the Braley School of Flying. The *Beezle Bug*, a two-place training plane constructed by the flying school officers, will go into production in a factory affiliated with the school.

The Braley Airport, which will cost \$150,000 when completed, has been started with the erection of an administration building. Three more steel and brick buildings are to be erected at once on the 360-acre field.

**V**ICTOR FLEMMING, famous motion picture director, flew to Wichita from Hollywood with Wallace Beery on March 21 to take delivery on a Travel Air cabin monoplane with a Wright 300 horsepower engine. Others in the party flying to Wichita in Beery's Travel Air plane were Noah Beery, Jr., H. C. Lippiatt, Bob Merriam and Slim Maves. Beery has a transport pilot's license.

**T**WO sport planes and a sport-training plane will be exhibited by the Swift Aircraft Corporation at the Detroit All-American Aircraft Show. One of the three colored semi-military sport planes will be held at Ford airport for demonstrations.

The plane to be exhibited on the floor is powered with a Kinner engine. It showed a speed of 110 miles an hour in test flight. It is a two-place plane equipped with dual controls. It is finished in a three-tone effect of black, red and pig-skin cream. It is upholstered in pigskin leather.

**T**HE annual engineers day at the University of Kansas, Lawrence, on March 14, was devoted entirely to aeronautics. Eight lectures on various phases of the aviation industry were given in the Central Administration Building.

The program included: Aerial Photography by Dr. L. S. Powell; Aeroplane Design by Mac Short, Stearman Aircraft Co., Wichita; Development of Commercial Air Transportation, C. E. Fleming, National Air Transport, Kansas City; Airports, L. W. Clapp; Airplane in Military Operations, Maj. O. Westover; Architecture of Airports, Edw. W. Tanner, Kansas City; Lighting of Airports, E. R. Cullom, and Airplane Varnishes and Protective Coatings, Robert T. Sapper.

## OKLAHOMA AIR NEWS

**M**RS. JAS. G. HAZLIP has been retained by the Spartan School of Aeronautics at Tulsa, Okla., as special instructor for young women students.

**C**ONRAD-TEMPLETON AIR SERVICE of Winona, Minnesota, has been appointed distributor for Spartan planes in Winona and the adjoining territory.

**M**USKOGEE has passed a bond issue for the improvement of the airport there and the purchase of additional ground to add to the present field.

## IOWA AIR NEWS

By R. W. MOOREHEAD

**T**HE Whitey sport plane, a two-passenger fifty-five horsepower monoplane, has been granted an approved type certificate by the Department of Commerce. Burd White, local aviator who designed and built the Whitey, states that under the certificate three types of power plants may be installed in ships, the three- and six-cylinder Anzani motors and the new type Velle fifty-five horsepower motor.

**G**RINNELL will have an intermediate landing field for air mail planes and an airport for commercial and transient machines, it has been decided by the local chamber of commerce. This is a part of the program of re-routing the air mail between Iowa City and Des Moines, with intermediate fields to be located at Marengo, Grinnell and Newton.

**G**EORGE D. LOWERS will organize a flying school in Des Moines, with a ground school only in operation until spring. In the ground school Mr. Lowers will instruct his classes in the rules and regulations of air traffic, meteorology, navigation, aerodynamics, and construction and operation of airplane motors.

**I**MPROVEMENTS at Rickenbacker Airport, Sioux City, will include the largest airplane hangar in Iowa, according to announcement of Arthur S. Hanford, in charge of the field. The hangar will be 140 feet by 110 feet and will contain rooms for sleeping quarters, shops, office and classrooms for the flying instruction school. It will be dome-shaped and will have a novel system of doors. Its capacity will be thirty standard sized planes or two trimotor planes and fifteen standard planes.

**B**AD weather has made conditions at the Des Moines airport bad, and little or no activity has been going on there for several weeks, although it is announced that just as soon as spring opens many improvements will be added to the field.

**T**WO bills, representing the first aviation legislation proposed in the state, were voted almost unanimously by Iowa senators on March 13. The bills provided for the licensing of planes and pilots and the making of rules governing flying, and for the granting of power to cities and towns to buy airports.

The licensing bill provides that planes flown in the state must be registered and licensed under the requirements of the Government, as must be anyone flying a plane which carries passengers. The bill contains provisions requiring planes to fly 1,000 feet high over cities and towns, and over open-air assemblies. Traffic regulations for balloons, airships and airplanes and requirements for the carrying of lights are included in a safety provision in the uniform bill.

In the second bill, cities and towns are  
(Continued on next page)

**Lindbergh to Paris**

**Byrd to North Pole**

**Byrd to South Pole**

**Question Mark**

**Hawks' Coast to Coast**

## ***Flight Dependability***

Safety, maintenance of schedule and fulfillment of transportation contract can only be secured by installing parts that have *already* demonstrated their performance dependability. Proof of this dependability lies in the fact that Thompson Valves are being used by the world's greatest airmen in their record-breaking flights. These feats and a score of others explain why Thompson Valves are the unquestioned choice in over 90% of all American-built airplane motors.

### **THOMPSON PRODUCTS, INC.**

*General Offices:* Cleveland, Ohio, U. S. A.

*Factories:* CLEVELAND and DETROIT



# **Thompson Valves**



*(Iowa Air News continued)*

given the right to acquire airports, levy a tax to finance a project, and issue bonds. The maximum tax in cities of 25,000 population or more will be one mill; in cities of 10,000 to 25,000 population, three mills; and in cities of 10,000 population or less, five mills.

**SOUTH DAKOTA NEWS**

By J. H. McKEEVER

**P**LANs for an aviation meet to be held September 15 to 21 are being laid by the Sioux Falls Chamber of Commerce. The committee in charge consists of S. A. Christison, E. C. Olson, Ira A. Moore, James A. Smeed and William Wilson.

**A**IR service between the Black Hills and Huron and Watertown will be inaugurated in the spring, Walter Halley, president of Rapid Air Lines, has announced. At Huron the line will connect with the railway-air route from Chicago to the Black Hills via the Northwestern railroad.

The Rapid Air Lines recently absorbed the Pioneer Lines, Inc., of Watertown, and a north-south line from Winnipeg to Omaha via Watertown is contemplated.

**G**OVERNOR Bulow has signed the bill recently passed by the legislature which is the first air legislation enacted by South Dakota. The state now provides for licensing pilots upon the Federal requirements

and empowers cities to acquire land to establish airports.

**NORTH DAKOTA NEWS**

By LLOYD C. TINNES

**T**HE Master Aeronautical Corp., propeller manufacturer of Grand Forks, has secured the contract to sell the products of the Curtiss Flying Service in the eastern half of North Dakota, according to an announcement by George B. Reynolds, president of the local concern. S. C. Connors, Curtiss representative, drew up the contract with Mr. Reynolds.

The local concern has purchased two Curtiss-Robins, the first of which will be delivered here in April, and will conduct a flying school at the Grand Forks airport this spring and summer, using the Curtiss service.

**A** GASOLINE filling station with 550-gallon capacity has been installed at the Grand Forks airport by the Standard Oil Company, according to John P. Hofsted, who will run the station. A 300-foot underground pipe carries the gas line out into the field for the convenience of pilots.

**A**RT BURNEVIK, former Grand Forks pilot, is now instructing a class of students at the Fargo aviation school. Burnevik formerly piloted a plane owned by John Hippe.

**J**OHAN HOFSTED and Al Berglund have a class of students at Grand Forks which is increasing steadily.

**DULUTH AIR NEWS**

By ARTHUR G. PATTERSON

**T**HE Commercial Investment Trust, Inc., of New York City, has extended an offer to city officials of Duluth to finance the equipping of the new municipal airport to be operated by the city of Duluth. The financing would include equipping the field with hangers, filling station and lights.

A municipal airport board is soon to be organized by members of the Duluth City Council. The members of the board will serve without pay and will be given authority to employ competent advisory and technical service in the planning and construction of Duluth's municipal airport.

City officials of Duluth were recently guests of the Jefferson Airways of St. Paul, Minn., on a flight in their Ford trimotor twelve-passenger plane. Pat Gallup piloted the plane.

Announcement has been made that positions at the municipal airport will be put on a competitive basis.

**MINNESOTA AIR NEWS**

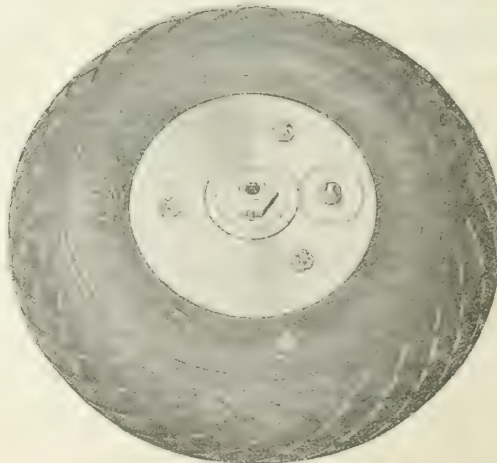
**M**RS. ALBERT G. WHITNEY, widow of the late Albert G. Whitney, has given a tract of land of 143 acres to the city of St. Cloud, to be used as a memorial airport for her husband. With the gift of the land was also \$650 which will be used for fences and seeding. The port is about 5 miles out of St. Cloud on a state highway.

*(Continued on next page)*

# JOHNSON MIDGET

## 10X3 PNEUMATIC TAIL WHEEL

**Quality**  
**Light Weight**  
**Strength**



**Simple**  
**Easy to Assemble**  
**Streamlined**

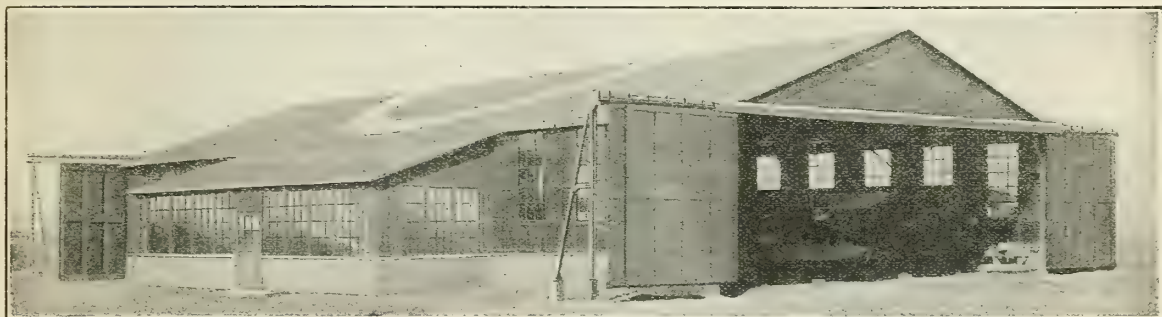
**A plane without brakes or tail wheel is becoming as obsolete as the automobile without 4 wheel brakes.**

**The JOHNSON MIDGET with Timken Bearings weighs less than 2 lbs. (4 lbs. with tire and tube). Easily mounted on any plane having wheel brakes.**

**Insist on Johnson Tail Wheels and you'll get the best.**

**JOHNSON AIRPLANE AND SUPPLY CO., DAYTON, OHIO**

# Quick Delivery and Erection of Standardized Fireproof Hangars



Truscon Steel Hangar—quickly erected at economical cost.

Built with clear floor space free of columns for the easy handling of airplanes and with large steel doors with or without glass and opening the full width, Truscon Hangars amply meet every aeronautical requirement. They are fireproof throughout with Steeldeck roofs, insulated and waterproofed, and with any amount of steel windows for daylighting. Repair shop may be in an adjoining lean-to or in a separate building. Truscon Hangars are designed to fit your needs. Literature and suggestions on request.

THE SECRET



OF SUCCESS

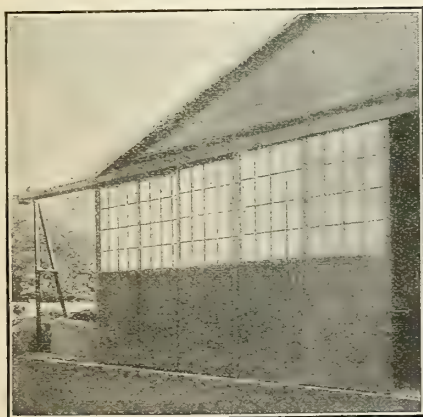
## STEEL DOORS of Advanced Design for Every Type of Hangar

Truscon Steel Hangar Doors are substantially built of quality workmanship. When open they occupy minimum space so as not to impede the movement of airplanes. Truscon Hangar Doors operate easily, sliding on straight or curved tracks. They are furnished in any specified size.

*Write For Quotations*

TRUSCON STEEL COMPANY, YOUNGSTOWN, O.  
AERONAUTICAL DIVISION

*Warehouses and Offices in all Principal Cities*



Truscon Steel Hangar Doors—durable and easily operated.

# TRUSCON HANGARS AND STEEL DOORS



(Minnesota Air News continued)

**E**QUIPPED with skis, a Mohawk Pinto plane was tested recently at Minneapolis by J. H. St. Martin, chief pilot of the Continental Aero Corporation of Montreal. Five planes of this type were ordered for use in the chain of flying schools opened throughout eastern Canada by the Continental concern.

**O**NE stock Pinto and one three-place cabin monoplane powered with a Warner Scarab 110 horsepower engine will be displayed by the Mohawk Air-Craft Corp. of Minneapolis at the Detroit All-American Aircraft Show. This will be the first appearance of the new cabin model.

**T**HE New Ulm Aviation Club has been formed, with Carl Schmidt as president. Instruction will be given by a pilot from one of the Minneapolis companies. The organization is the first of its kind in that vicinity.

## WISCONSIN AIR NEWS

By WILLIAM SCOLLARD

**T**HE Hamilton Metalplane Company of Milwaukee has been awarded a contract for twenty-eight all-metal airliners by the Seaboard Aircraft Company. The planes will be used between New York, Albany, Boston, Newport and Washington and will make connections at Albany with the Twentieth Century Limited.

Officials of the company state that delivery of the planes will extend over a period of several years, at the rate of one a month. The Hamilton company anticipates a production schedule of close to 100 planes this year.

**M**IDWEST Airways, Inc., Milwaukee, recently had on display at Gimbel's Milwaukee store, a Consolidated Husky training plane identical to those used in Army, Navy and Marine Corps training.

**T**HE Glider Club of Milwaukee is building two gliders for trials this spring, to test the feasibility and possibility of air trains in the future. J. P. Schroeter is founder and president of the club.

**C**ARL F. SCHORY recently resigned as secretary of the contest committee of the National Aeronautic Association to accept an executive position with the Hamilton Aero Manufacturing Company of Milwaukee.

**E**VENING courses in aviation, airplane engines and construction are being offered by the University of Wisconsin extension division at Milwaukee. L. A. Wilson, engineering instructor at the university, is teaching the course of airplane engines.

**A**N amendment to a bill in the state legislature to make it unlawful for an airplane pilot to take up passengers unless he holds a Federal commercial license was

suggested at the first 1929 Fox River aviation conference held recently at Oshkosh. The suggested amendment would restrict a pilot holding a private license from carrying passengers. Other amendments suggested would make it unlawful to fly under 1,000 feet and in an unlicensed plane. Milwaukee; Fond du Lac, Neenah, Menasha and Green Bay were represented at the conference.

**T**HE following courses in aeronautical engineering will be offered next semester at the Marquette University college of engineering: elements of aviation, design of propellers, aircraft power plants, aerodynamics, elementary airplane design, airplane design, and the history of aeronautics.

**B**USINESS men of Park Falls, are in favor of the establishment of an airport at that city, and it is probable that definite action will be taken on the project during the coming summer.

**T**HE University of Wisconsin is planning the establishment of a department of aeronautics if the budget request is granted by the state legislature. A department of aeronautics has been contemplated for some time, but this is the first definite step toward its establishment.

**K.** M. HAUGER, president of the North American Airways, recently spoke before the common council at New London advocating an airport for that city.

**T**HE following were recently elected officers of the airport board of control of Rhinelander: Frank P. Kennedy, president; Charles G. Grau, vice-president; Harry Hlava, treasurer; and Gentz Perry, airport surgeon and secretary. The board voted to make no charge against private planes that land at the Rhinelander airport.

**W**HEN Ed Hedeon and other Racine aviators were ordered to vacate the property occupied by Air City, Dr. George L. Ross offered the use of a 103-acre field a few miles west of Racine free of charge. Dr. Ross founded Air City, which property he owned at the time but has since sold.

**A** COMMITTEE of seven men from Manitowoc recently met with a committee of six from Sheboygan at Sheboygan, Wisc., to discuss the question of placing Sheboygan and Manitowoc on an air mail route.

**T**HE Nekoosa Edwards Paper Co. Airways was incorporated recently for the purpose of manufacturing and selling airplanes and engaging in the operation of airplanes. Signers of the articles of incorporation are: J. E. Alexander, C. A. Jasperson and E. P. Gleason.

**T**HE National Rivet & Mfg. Co., Milwaukee, has recently been incorporated for the purpose of manufacturing brass, copper, aluminum and steel rivets—solid, semi-

tubular, tubular and split types used for brake bands and facings for all classes of machinery, for airplanes, etc. This new company absorbs the U. S. Rivet & Mfg. Co., of Mishawaka, Indiana. The officers of the new company are: P. H. Dorr, president, and Wm. Fleming, Jr., secretary-treasurer.

## Aviation Service League

**T**O supply authoritative information on every detail of aviation activity, using the counsel of a wide circle of specialists, is the purpose of Andrew L. Schaidler, Charles J. Dott, and Elmer W. Gross, who recently organized the Aviation Service League, Inc., of Milwaukee. The authorities who will solve problems and answer questions sent to the league include: Secretary Smith to Governor Kohler, who will answer all questions on aviation laws in Wisconsin; Speed Holman, chief pilot of the Northwest Airways, as consulting pilot; Mr. Sipp, of the Pyle National Co., the consultant on airport lighting. This service, covering the entire aeronautic field, will be free to members of the League.

**A**N Esline steel hangar, recently constructed at Centre Airport, Kylertown, Pa., on the crest of the Alleghenies, 1790 feet above sea level, withstood a blizzard with a wind velocity of 110 miles per hour shortly after being erected. Houses in the vicinity were lifted bodily from their foundations. The hangar was built by the Esline Company of Oconomowoc, Wisc.

**M**YRON S. LOCKE has been employed by the Esline Company of Oconomowoc, Wisc., as assistant sales manager.

**S**TU AUER, president of Auer, Inc., Milwaukee, specialists in aviation insurance, has started on an investigation tour of some fourteen states. Mr. Auer will end his tour at the Detroit show.

## SUPERIOR AIR NEWS

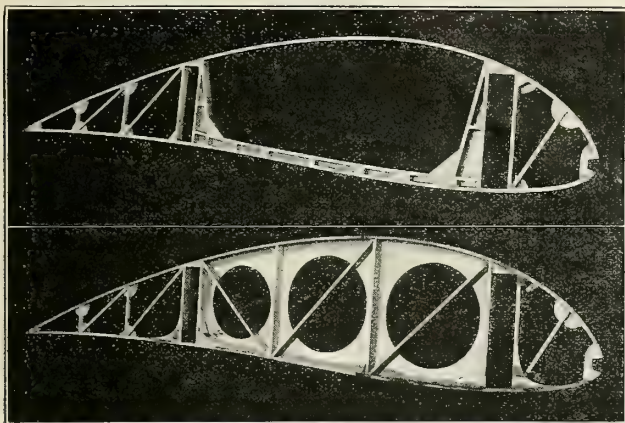
By ARTHUR G. PATTERSON

**T**HE new airplane hangar to be built at the Superior municipal airport at Billing's Park is to be completed June 1. It is to be built of steel and brick at a cost of \$25,000 and will replace the present wooden hangar now in use. The last definite construction plans call for a hangar 100 feet long and 80 feet wide with an 18-foot clearance. The hangar will conform in construction to the requirements of the Department of Commerce in order that the Superior airport may qualify as an A1A field.

When completed the hangar will have sufficient room for more than fourteen planes of average size. In addition, the hangar will house the offices of the head of the Lakes Airways, of which L. A. Hoffman of Superior is the president, and which firm has leased the airport for five years. Rest rooms, a machine shop and classrooms for instruction of students of the air school to be conducted by the company will also be in the completed hangar.

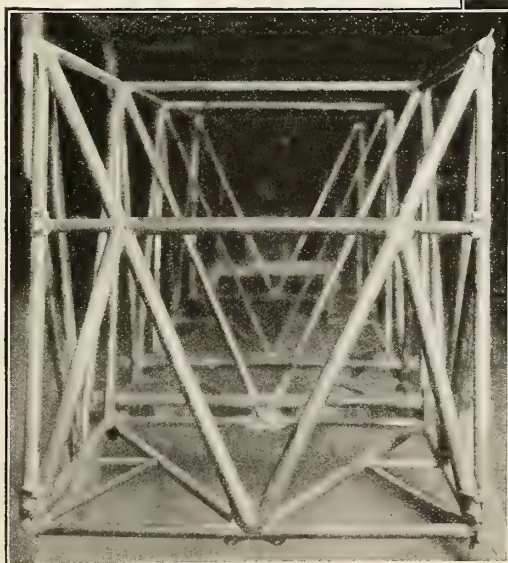
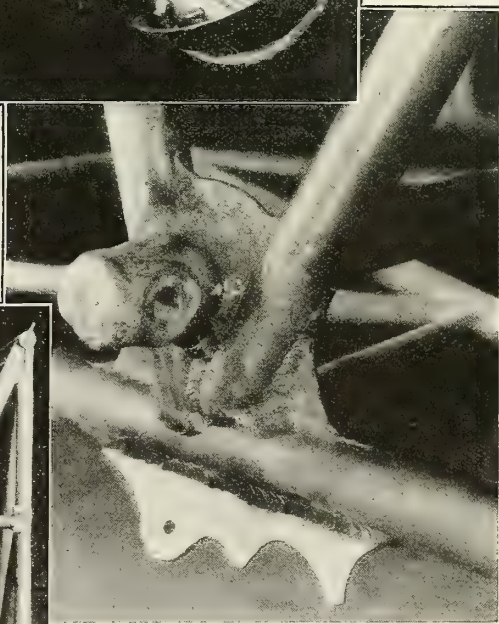
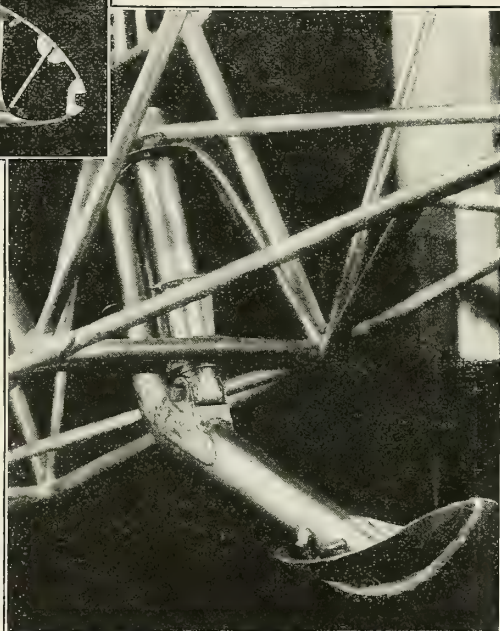
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## REFINEMENT OF DETAIL



WHEN flying becomes a business, good performance and an adequate factor of safety are not enough. Equipment must be capable of continuous operation with maximum reliability, minimum upkeep and with the least possible charges for depreciation, maintenance and repair. The consideration given these factors in the design of Knoll aircraft has been as thoughtful as the consideration given to performance. Makeshift construction has no place in the airplane which must operate at a profit.

The KN-1 is the product of an engineering staff of long experience and thorough training. It is built in a factory with every facility for quality production by an organization that believes the future of flying depends on machines which can be operated to show a profit.



*The* **KNOLL**  
AIRCRAFT CORPORATION  
471 West First Street  
WICHITA, KANSAS



(Superior Air News continued)

Other improvements scheduled for the coming summer at the municipal airport include a complete and modern lighting system similar to those in operation at some of the country's largest airports.

**A**N attempt is being made by city officials to have Superior designated as a Federal airport of entry from Canada to the United States. At present St. Paul, Minn., is the port of entry farthest north, and the only such port at the present time in Wisconsin is Milwaukee.

**A**HANGAR built by the Government at Parkland just outside of Superior for the use of four Army planes attached to the vacation party of ex-President Coolidge was completely wrecked when a 52-mile-an-hour wind hit it. The hangar was built entirely of wood and was 150 feet long and 30 feet wide.

## NEBRASKA AIR NEWS

**L**INCOLN AIRCRAFT CO., incorporated in Delaware, which has taken over the old Lincoln Aircraft Co., will concentrate on the production of a tandem training biplane using OX-5 engine. Although this plane will take engines up to 110 horsepower, it is especially designed to make use of the many OX-5 power plants now in the hands of training schools.

The officers of the new concern are: Victor H. Roos, formerly treasurer and general manager of the Swallow Airplane Co., president; Ray Page, vice president and director of sales; and Charles Carroll O'Toole, secretary-treasurer. The directors include F. E. Beaumont, H. G. Paul, Robert De Voe, and Carl Weil.

## SAN ANTONIO AIR NEWS

By GENE SMITH

**S**PONSORED by the San Antonio Junior Chamber of Commerce and other civic organizations, a movement is under way in this city to inaugurate a complete ground school course in aviation in the senior schools.

The course is to be modeled after the ground school work in the Army, and plans are being made to secure Army instructors in the various studies. The course will not include actual flying, but will consist of work leading up to it and fully covering the fundamentals of aeronautics.

Although colleges as yet have not been faced with the question of giving credit for aeronautical training, it is thought here that the course will at least receive credit for vocational shop work. It is also the intention of school authorities to organize the work so that it will be acceptable to aviation training schools.

**H**EADED by C. H. FORRESTER of Chicago, the Southern College of Aviation has opened in San Antonio with an initial enrollment of 125 students. Complete ground school work will be followed by actual flying instruction.

**P**RELIMINARY sketches of the administration building of Randolph Field have been forwarded to Brig. Gen. Frank P. Lahm, commanding officer of the Air Corps training center, and to Capt. A. W. Parker, construction quartermaster of the Eighth Corps Area, by the War Department.

The administration building, which faces the main entrance of the building area of the 2,400-acre field, is of the Spanish design. It will include a long two-story building with a 175-foot tower, housing the field's water reservoir, a meteorological station, and will have a beacon on top.

Among the interesting features planned for Randolph Field is the location of the building area—4,500 feet by 4,700 feet—almost in the center of the field. The ultimate cost of improvements at Randolph Field will be between \$30,000,000 and \$50,000,000.

**T**WO new floodlights from the General Electric Co. are being put into operation at Kelly Field. One, placed on the line in front of the operations office, was tried out with students of the Advanced Flying School in their night flying work. The other light, on the opposite side of the field, is now being installed.

## FORT WORTH AIR NEWS

By CAPT. W. H. SCOTT

Southern Air Transport, Inc.

**F**ORMATION of the Southern Air Transport, Inc., as the result of a merger of Texas Air Transport, Inc., Gulf Air Lines, Inc., and several other air and transportation companies, was announced by A. P. Barrett of Fort Worth, president of the new company, upon his return from New Orleans where the negotiations were completed.

The Southern Air Transport, Inc., will serve the major portion of the South with air transport service, and will operate the entire air mail service of the South. Its subsidiaries will operate Contract Air Mail Route No. 21 from Fort Worth and Dallas via Houston and Galveston; No. 22, Dallas and Fort Worth via Waco, Austin to San Antonio and Laredo; No. 23, Houston via Beaumont to New Orleans; and No. 29, New Orleans to Mobile and Birmingham to Atlanta. C. A. M. 23 will shortly be operated from Houston to Brownsville, carrying Mexican mail. At Brownsville the line will connect with mail and passenger lines operating to Tampico and Mexico City, and Tampico to Vera Cruz connecting at Merida, Yucatan, with the Pan American lines into the Canal Zone and thence to South America.

Barrett will be president; and Tom Hardin, formerly vice-president and general manager of the Texas Air Transport, Inc., will be vice-president and general manager of the new company, and C. R. Smith, treasurer of the Texas Air Transport, Inc., will be treasurer.

**A**LARGE delegation of business men from Mineral Wells flew to Fort Worth for the purpose of inviting the aviation com-

mittee of the Fort Worth Association of Commerce and those actively engaged in aeronautics in Fort Worth to assist in the opening of the Mineral Wells airport on April 6-7. The visiting group was composed of Allan Guin, vice-president of the Mineral Wells Chamber of Commerce; Amon Arnold, field manager; J. W. Smith, H. A. Zappe, E. A. Smith, L. J. O'Connell, C. F. Cowden, Ace Bragunier, pilot of the plane; and G. E. Flaherty, manager of the Golden State Airways, Los Angeles.

**B**IG SPRING has been designated a transfer point and divisional headquarters of the Texas Air Transport, according to the latest plans of Tom Hardin, general manager of the T. A. T. It will be the divisional point for all passenger lines to connect Fort Worth and Dallas with El Paso, and Big Spring with San Antonio. Officers of the Big Spring Airport Company are Ray Wilcox, president; R. Reagan, vice-president; Frank R. King, secretary; and A. J. Crawford, L. S. McDowell, T. S. Currie, and Fox Stripling, directors.

**B**IDS on the new air mail route between Louisville, Memphis, and Fort Worth, will be asked within the next few weeks, according to the divisional postmaster of Fort Worth.

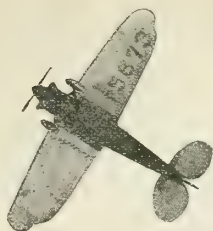
**A**T the South Western Exposition and Fat Stock Show, an aviation display was held at the Coliseum. Texas Air Transport had a large display of lighting equipment, Wright engines, parts and all kinds of instruments. The National Air Cadets showed scale models of airplanes and drawings made by the boys of the organization, and Seth Barwise, president of the Texas Flying Service, exhibited a Command-Aire plane on the ground. The association of commerce displayed large air maps showing the various stages of the growth of the air mail and passenger lines up to the present time and all the new scheduled lines that will be in operation in the near future.

**A.** P. BARRETT, president of the Southern Air Transport, was thanked by the Texas Senate for the active part he had taken in the advancement of aviation in Texas. The motion was printed into the official record of the house.

**T**HE Texas Flying Service has been appointed distributor of the Command-Aire planes for Texas. The company proposes to commence a large flying school. Each student will receive all instruction from the same pilot. Henry Woods is chief pilot of the concern. Seth Barwise, to whom the first air mail contract in the South was granted, is president of the firm.

**P**LANs to make the Fort Worth airport one of the most modern and up-to-date in the country are now under consideration by the Fort Worth City Council. Bill Fuller, city airport manager, has made a point of getting the views of prominent aviators landing in the city during the past month.

(Continued on next page)



**A**T the Detroit show, all eyes will be focused on WACO's new offerings for 1929. For, mindful of WACO's past success and records of performance, the air minded have come to expect of WACO the last word in refinement of design and excellence of performance.

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(Fort Worth Air News continued)

Recommendations by Capt. Frank Hawks were for a large concrete apron 100 feet wide from the hangars on to the field, double the size of the present hangar space, radio tower and weather bureau, separate office buildings, lounge rooms, and a modern hotel or restaurant.

## DALLAS AIR NEWS

By CAPT. W. H. SCOTT

**F**ORMATION of a glider club is now being considered by the Dallas Flying Club in the near future. A committee has been appointed to investigate possibilities of such an organization and to locate sections of land suitable for glider work.

**W**ORK on the new Army airport at Grand Prairies will be completed in time for summer training. This field will accommodate all Government planes, and reserve officers will be sent there for instruction from the Eighth Corps Area. Lieut. Harry Weddington, Army Air Corps, in charge of 366th Observation Squadron, is superintending activities at the new field.

**O**VER 100 students, from practically every state in the country, are now taking instruction at the Dallas Aviation School. There are also students from Canada, Mexico, China and Cuba. Capt. Bill Long is manager of the school, and W. C. Harmon is secretary in charge of students. During the coming summer modern barracks and a

hotel will be built by the Love Field Development Company.

**B**YRON GOOD, manager of Good and Foster, oldest aviation firm in Texas, has been appointed manager of the Dallas Airport at Love Field, by the Dallas City Council.

**H**OWARD WOODALL and T. G. Shaw, former owners of Travel Airways of Dallas, have become part of the personnel of Texas Air Transport. Woodall has been appointed instructor at the T. A. T. school at Fort Worth, and Shaw is with the administrative staff on the field.

**T**HE new Texas Air Transport Flying School at Dallas has been opened in the old Travel Airways hangar, and is in the charge of Charles Pedley. New office buildings and a large room for ground school training have been built into the hangar. A depot for the Texas Aero-Motive Corp. will also be established there. Curtiss-Robbins and Travel Airs are being used for instruction purposes.

**A** NEW invention that may influence the propeller industry has been shown here by the inventor, J. M. Martin, Dallas County farmer. Using a principle of "harnessing" the air stream generated by a tubed airplane propeller, Mr. Martin has developed a model that has shown great efficiency in tests made at the Martin ranch. The model was built by W. F. VanCleeve of the VanCleeve Airplane Company at Love Field, and was re-

cently demonstrated before engineers of the Stout Airplane Company of Detroit. A patent on the principle was obtained by John Spellman, attorney for the inventor.

**T**HE quota asked of the city of Dallas by the Tulsa-Dallas Safe-Way Airlines will be raised, according to a member of the Dallas Chamber of Commerce. The amount asked was \$100,000. Five big trimotored Ford planes are to be used on the route, which will open early in April. Extension of the line to St. Louis is also being considered.

**W.** B. MAYO, chief engineer of the Ford Motor Company, Aeronautics division, was in Dallas recently with his daughter Olive Mayo. Mr. Mayo was making a tour of the country studying various climatic conditions in the southern states. His big plane piloted by Garza Wooten arrived in a heavy downpour of rain and a ceiling of not more than one thousand feet. The plane was brought down skillfully and taxied up to the hangar as if bad weather or the muddy field was to its liking. Mr. Mayo said that the plane of the future must be of the all weather type if it is to meet all-conditions in air transport service.

**G**ARZA WOOTEN, formerly with Dallas Air Taxi, has been appointed pilot of the Ford trimotored plane *City of Dallas*, one of the planes to be used on the new passenger line between Tulsa and Fort Worth. Three years ago Garza was hopping around in an old Jenny or Standard plane.

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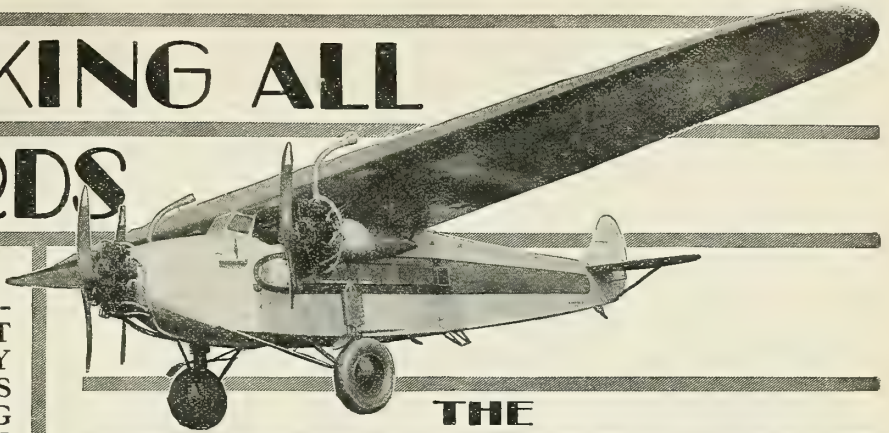
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Assisting the author in the preparation of this great book were many aircraft engineers, manufacturers, aeronautical magazines and governmental departments. This is your assurance that it contains everything it should—that it is practical—that it is up-to-date.

It deals with modern aircraft engines and miscellaneous equipment, such as carburetors, magnetos, starters, aeronautic instruments, etc. It also includes types of aircraft, controls, nomenclature for aeronautics and complete information pertaining to air commerce regulations, etc. Adequate space is devoted to the Wright "Whirlwind," the "Wasp," the Curtiss, Packard (including the monster X-type 24 cylinder engine), the Fairchild-Caminez (the engine without a crankshaft or connecting rods), and other leading makes, including some of the foreign makes of engines.

One of the big features is the 400 illustrations, many made especially for this book, including master charts with reference figures in color. In effect they take leading aircraft engines apart and lay the many parts right before your eyes for you to examine and study. Large folding charts printed in three colors show the complete lubrication system of leading engines in detail.

Practical, usable information is given on detecting worn parts and how to repair them. It shows where troubles are likely to develop and what to do to correct or repair them.

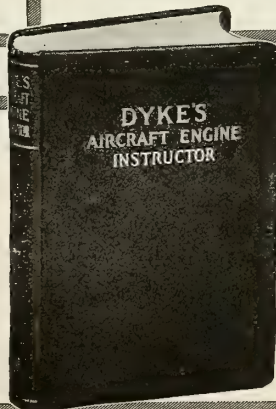
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"Wasp" Aircraft Engines  
Curtiss Aircraft Engines  
Packard Aircraft Engines  
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Miscellaneous Aircraft Engines  
Lubrication of Aircraft Engines  
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## LOUISIANA AIR NEWS

By HAROLD A. DEMPSEY

**B**IDS will be asked on April 8 for the construction of the new municipal airport at New Orleans, according to an announcement made by the Orleans Levee Board. The new port will be located on Lake Pontchartrain, adjacent to the east bank of the Industrial Canal. It will have a land depth of three thousand feet and will extend out into the lake approximately two thousand, eight hundred feet.

It is expected that the work will be completed within five months after the contract is let. The contract calls for concrete sheet piling on the three lake sides of the port and a fill within the boundaries. The work, it is estimated, will cost in excess of \$200,000. The clearing of land, especially camps extending over the water in that section, has already begun and will be completed by the end of April.

In choosing the east bank as location for the port, permanency of the project was assured. The site will be dedicated officially to the city at the next session of the legislature, according to Joseph Haspel, president of the board.

**T.** B. HERNDON of Mansfield has received a certificate of appreciation from the Guggenheim Fund for his achievements in behalf of aviation. Through Mr. Herndon's efforts, the airport at Mansfield was finally built. It was also due to his

activity that it was marked according to plans of the War Department before any request was made.

**A**NNOUNCEMENT has been made by the Wright Aeronautical Corp. that New Orleans will be the location for one of the twenty-six service stations to be established by that company.

In the southern section, the Texas Aero-motive Corp. will coöperate in conducting service stations at the following places other than New Orleans: Big Spring, Brownsville, Dallas, El Paso, Houston and San Antonio, Texas; Texarkana, Ark.; Birmingham, Mobile and Atlanta.

**A**LVIN CALLENDER FIELD, municipal airport at New Orleans, is now equipped with a new rotating beacon. Having an 8,000,000 candlepower beam, the beacon revolves at the rate of six revolutions per minute, throwing a beam one degree above the horizon from an elevation approximately twenty-five feet above the field.

Ceiling lights have been installed at the airport, and the installation of other illuminating equipment, including boundary lights and floodlights, is now under way.

**T**HE Southern Aeronautical Service's new field, located across the river from New Orleans in Westwego, has been developed into one of the best in the South and is equipped with fifteen hangars. The flying school is located in New Orleans and

began active work around the first of the year with a nucleus of sixty students.

**T**HE Aero Club of Louisiana, which was organized in New Orleans ten years ago, met recently and elected officers for the year. Gordon Callender was elected president; George A. Hero, Jr., vice-president; and Raymond H. Saal, secretary-treasurer.

Plans for the establishment of a club-room in the downtown business district of New Orleans were formulated at the meeting.

## ALABAMA AIR NEWS

By ROBERT H. BROWN

**T**HE outstanding events of interest to Alabamians perhaps are the fight Birmingham is making for a new municipal airport and the merger of the Gulf Airlines, Inc., with the Texas Air Transport.

The Junior Chamber of Commerce of Birmingham is making a real drive to interest the people in securing a new municipal field and to urge the city commissioners to take some action on the matter. It has been pointed out that, unless adequate facilities are provided, the Gulf Airlines, air mail operators through Birmingham, will cut the city, leaving Birmingham without air mail. Roberts Field is too small and rough for the air mail Fokkers.

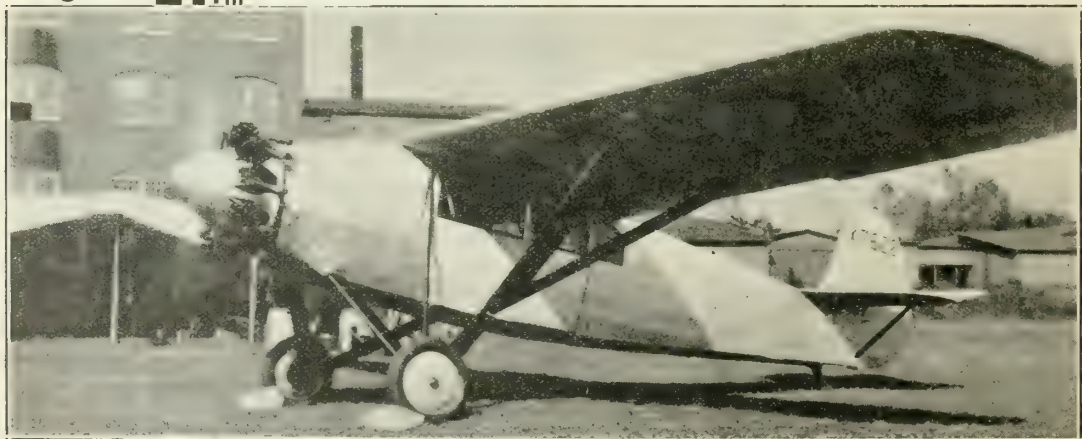
Then comes the announcement that Gulf Airlines has been merged with Texas Air Transport.

(Continued on next page)

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(Alabama Air News continued)

THE first plane to be manufactured by the Southern Aircraft Corp., at Birmingham has been completed, and the first test flight made successfully. The plane is a three-place biplane, powered with a Curtiss OX-5 motor. This new company was formed last summer to manufacture planes and is headed by Glenn E. Messer.

NEW airports have been completed at Roanoke and Wedowee.

THE first air school to locate in Alabama has been organized at Montgomery. It will operate from the new municipal field under construction there. The company is headed by L. G. Mason as president and R. B. Potts as chief instructor. The school also is state distributor for American Eagle planes in Alabama.

THERE are possibilities of a new line being started from Birmingham to Dallas, Tex. At a conference with representatives of the various cities along the proposed route at Birmingham recently, the representatives promised adequate facilities and guaranteed a certain mail poundage.

MAXWELL FIELD, Army station at Montgomery, is now open to the public any time during working hours, with the exception of Saturday afternoon and Sundays, at which time the flying department is closed.

## KENTUCKY AIR NEWS

By A. W. WILLIAMS

COL. EDGAR RENSCHAW, of Hopkinsville, owner and operator of the Renschaw flying field, is an aero enthusiast, and has done a great deal to interest western Kentucky in aviation. Renschaw owns and operates a plane of his own. He is a Hudson-Essex dealer at Hopkinsville, and all-around sportsman, his hobby being small game hunting.

C. S. (Casey) JONES, president of Curtiss Flying Service, recently announced that bids will soon be asked at Louisville for construction of a new \$40,000 hangar, on one of three sites that have been leased for ten years at Bowman Field. This hangar will be followed by two others a little later.

IN Kentucky the aviator is paying a state tax of 5 cents per gallon on gasoline, this tax going to the state road funds, whereas the planes obviously never use the roads. Under the Kentucky laws, no exemption is made for commercial or industrial users of gasoline, not even in the case of river boats. Legislators are favorable to air developments, and there is hardly a doubt but what properly presented bills would gain exemption for air engine fuel.

AT a meeting of the Louisville and Jefferson County Air Board, held March 8, the board decided to erect a \$20,000 adminis-

tration building at Bowman Field, Louisville. This building will be 90 x 40 feet, with a two-story entrance and one-story wings. Plans submitted by Herman Wischemeyer, architect, were approved. Construction, to start shortly, will be of brick and stone.

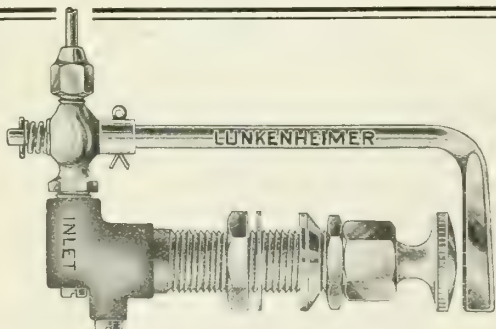
The board also announced closing of a deal for leasing twenty acres of additional land, to the east of the municipal field, in order to provide an extra 1,000 feet of runway. The board further agreed to lease to the Standard Oil Company of Kentucky space for a filling station at the airport.

CAPT. F. E. GALLOWAY, of Paris, Ky., has been appointed to succeed Lieut. James A. Ellison as Army Air Corps officer in charge at Bowman Field. Capt. Galloway has been connected with the office of Assistant Secretary of War C. B. Robbins for a year.

Lieut. Ellison will be transferred to Selfridge Field, Mich., where he was stationed prior to coming to Louisville.

THE Kentucky Air Board held its first meeting on March 7 to discuss plans for state development. The Aero Club of Kentucky and the Louisville and Jefferson County Air Board offered assistance in laying out fields. C. W. Vaughn, secretary of the Mayfield Chamber of Commerce, William B. French, managing director of the Madisonville Chamber of Commerce, and George W. Meuth, of Bowling Green, out-

(Continued on next page)



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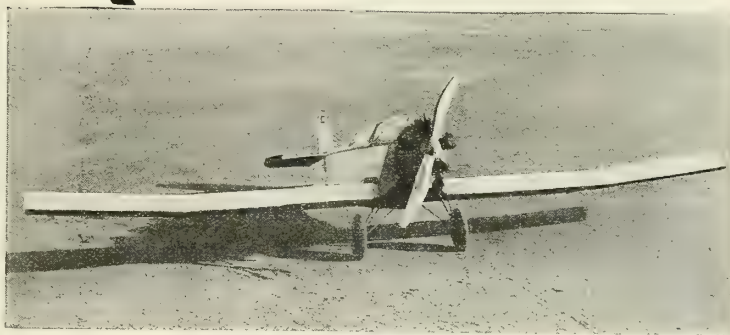
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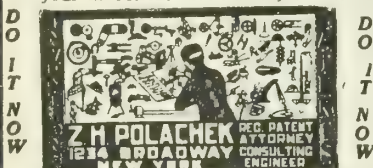
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*Philadelphia and Detroit**(Kentucky Air News continued)*

lined to the board the steps underway in those towns for obtaining landing fields in western Kentucky.

The board adopted Department of Commerce interstate flying rules. Resolutions were adopted also to provide road connections to municipal or publicly owned fields, and for marking directions to all state fields. Construction of landing fields was held to be most important.

**I**N a talk with Ted Kincannon, Louisville division manager for Curtiss Flying Service, at a time when a good many ships were in the air, or taking off and lighting, the writer asked: "Ted, how many ships have you at Bowman Field?"

"There are about twenty ships," he replied, "which recognize the field as their home port."

"Well, isn't that about twice as many as you had last year using this field?"

"Closer to four times as many, and I'll go further and give it as my opinion that there will be fifty ships on this field by August."

**Louisville Notes**

By JOHN WALKER ROGERS

**A**PPPOINTMENT of an advisory aeronautical board by Governor Flem D. Sampson of Kentucky has been announced. Turney Grantz, Lieut. James A. Ellison, military commander of Bowman Field; and Carl Bernhardt, associate editor of the Louisville *Herald Post*, comprise the board.

This advisory body will be responsible only to the Governor and is expected to advise and work with existing state agencies for the promotion of aviation and air-mindedness throughout the state. The appointees were made aide de camps on the staff of the Governor with the rank of colonel.

In carrying out the Governor's plans for aviation development, the body will cooperate with the Kentucky Progress Commission. The program of the board will include co-operation with the American Legion's attempts to have the national Legion convention to be held in Louisville during October of this year dedicated to Aviation. It will encourage the establishment of aviation industries and stimulate transcontinental and feeder transport air traffic in the state.

The body will also endeavor to develop facilities for night flying and aid the American Legion in its campaign to air mark all the cities and towns in Kentucky.

**L**YMAN S. WOODRUFF has been promoted to traffic manager for the district of Kentucky for the Continental Airlines, Inc., according to an announcement made by Joseph Sabin, vice president. The promotion came as a result of the reorganization of the Continental by the Universal Aviation Corporation.

**L**IEUT. JAMES ELLISON, chairman of aviation committee of the National American Legion Convention, has appointed William E. Morrow, secretary of the Louisville Board of Trade, to represent the com-

mittee in Washington. Mr. Morrow will go to Washington to interest the War Department and officials of the Legion in the plan to dedicate the national convention to aviation.

**T**HE National Aviation School has announced through its general manager, E. J. Pinaire, that a connection has been made with the Curtiss Flying Service whereby the Curtiss company will furnish flight instruction for the students in the ground training classes of the school. Ted Kincannon, general manager of the Curtiss Flying Service, made known that this arrangement would make it possible for students to use Curtiss equipment in their flight training.

The National will continue, as formerly,

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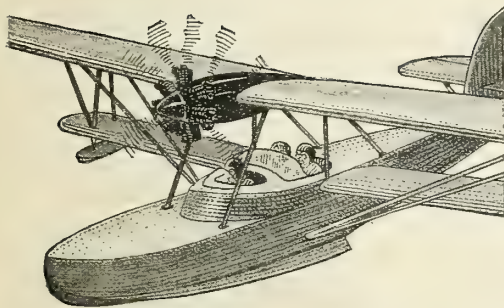
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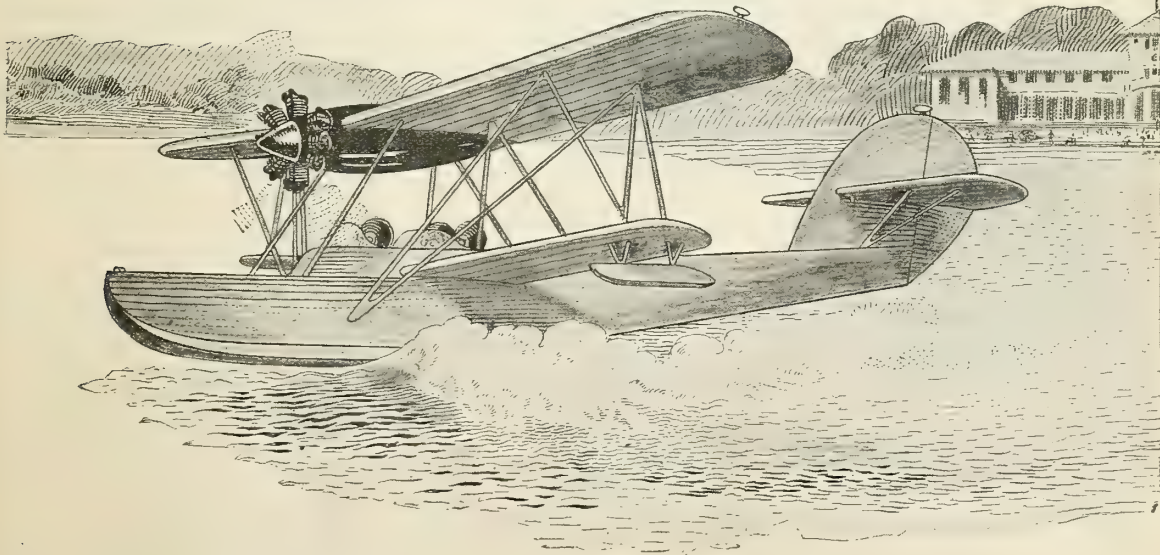
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## TENNESSEE AIR NEWS

BY VIRGINIA MATTHEWS

**B**IDS for the construction of the Chattanooga-Nashville section of the Atlanta-Chicago airway will be opened April 1, at the office of E. W. Libby, chief clerk, Division of Supplies, Washington, D. C. The work consists largely in the installation of beacon lights for a distance of 120 miles.

**C**APT. DONALD P. MUSE, assistant inspector of the Fourth Corps Area, arrived in Nashville March 14, for an inspection of the 105th Observation Squadron.

**A** CHANGE in the air mail schedule on the Chicago-Atlanta airway has been announced by officials of the Interstate Airlines, Inc., operators of the line. The northbound plane will leave Atlanta at 9:25 a.m., and the southbound plane will leave Chicago at 9 a.m. The change will become effective on April 1, and should be especially useful to Nashville business interests sending New York mail.

**T**WO bills designed for the promotion of aviation in Tennessee are to be presented to the state legislature after it reconvenes. Capt. Walter Chandler, city attorney of Memphis, has drafted a bill to establish plane intercommunication and standard qualifications for pilots. A measure for the establishment of emergency landing fields along air routes between Memphis, Nashville, Chattanooga and Knoxville has been worked out by L. W. Hughes, Memphis banker. The bill proposes to establish emergency fields every 10 miles.

## FLORIDA AIR NEWS

By J. P. TUBBS

**A**IR-MINDED Florida cities, caught inadequately equipped to handle an unprecedented amount of air traffic during the winter season, are determined that other seasons shall not find them unable to care for such visitors. To this end, many cities are discussing and carrying out plans for the construction, equipment, maintenance and regulation of suitable airports.

**A** RECENT appeal broadcast by the Lakeland Aero Club brought a ready response from more than a hundred citizens, who under the leadership of Capt. I. B. Purdy, attacked the Haldeman-Elder Airport and in one brief afternoon's skirmish annihilated an army of pine stumps, scrub palmetto roots, trees and underbrush. The entire west side of the field and a 300-foot strip on the east side are free of obstructions as a result.

**T**HE new south waterfront landing field at St. Petersburg was recently dedicated by city officials with brief and simple ceremonies. The field at present is equipped with only one runway, but city officials have begun consideration of plans for additional runways and further development.

Say you saw it in AERO DIGEST

**L**IEUT. DONALD DUKE, formerly chief of the Army Airway's Section and author of Airports and Airways, has resigned from the Army Air Corps to accept a position with Pan-American Airways, Inc., and will be in charge of the operations of this company between the Canal Zone and Nicaragua. This company now has an office in Cristobal which will be Duke's headquarters.

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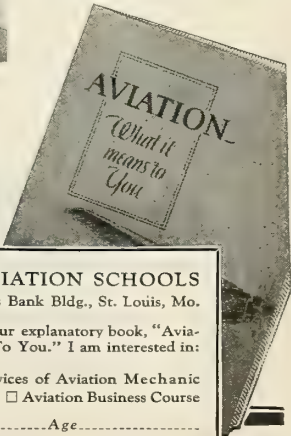
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# FOREIGN NEWS IN BRIEF

Compiled from reports from AERO DIGEST'S correspondents, the Automotive Division and the Transportation Division, Bureau of Foreign and Domestic Commerce

## ENGLAND

### British Air Navigation (Consolidated) Order

COMBINING the most recent amendments made by the English government, the Air Navigation (Consolidation) Order issued in December, 1928, gives the complete rulings now in force concerning civil air travel in England. The new features of the air code tend to increase safety through governmental supervision.

When flying over a routed or much traveled course, either by compass or by landmarks, planes must keep at least 300 yards to the left of the course. Specifications are given for the size of the identification markings on the wings and fuselage; and the requirements are listed for navigation lights.

The new additions include as well an order for the periodic overhaul and the daily inspection of all English planes, and all pilots are required to keep log books of flight. Provision is made for new signals under all conditions. The urgent signal PAN is provided for radio telegraphy, and MAY-DAY (m'aider) for radio telephony. Other matters recently considered were smoking on aircraft, and defining English aircraft.

This report can be obtained from the English Library of Information.

AFFORDING space for fifty airliners of the cross-channel routes, the new hangar at Croydon Aerodrome, London, will be opened in the near future. This hangar, which is one of the largest in the world, and which will double the hangar space of the airport, was made necessary by the increase in the cross-channel traffic.

A HUGE direction-finding wireless beacon now being constructed at Orfordness, England, is expected to be able to give bearings automatically to aircraft having an ordinary receiving set and a stop watch. This beacon will work on a wave length of 1,040 meters. It is being built for the

British Air Ministry at a cost of \$25,000 and will be completed by spring.

FLIGHT LIEUT. S. J. MOIR and Pilot Officer H. C. Owen, both of R.A.A.F., will soon start their return trip from London to Australia in a Vickers Vellore biplane, powered by a 460 horsepower Armstrong-Siddeley geared type engine.

FLYING boat service between Liverpool and Belfast will be operated by Imperial Airways from March to September, when the fog is not prevalent.

THREE tons of fuel with a non-stop flight of seventy-two hours is the expected performance of a new monoplane designed for the British Royal Air Forces. After preliminary trials the plane will be flown to Cape Town by stages, and the return trip of six thousand miles will be attempted non-stop. The tanks in the wings have a capacity of three tons of fuel.

SAFETY devices and compression-ignition engines were among the principal objects of study of the English Aeronautical Research Committee, according to its report for the year 1927-28. The work of the committee extended over the entire aeronautical field.

The consideration of fixed and automatic slots received much attention, as did the interconnection of slots and ailerons, and the pilot plane.

The report can be obtained from the British Library of Information.

ORDERS totaling over a million dollars for airplanes ranging from two-seater light planes to twin-engined flying boats have been received by English airplane manufacturers during the last few months. The bulk of the orders came from Australia and Canada, in both of which countries flying is rapidly becoming more popular.

## GERMANY

### News from Germany By Dr. Carl Hamms Pollog

GERMAN commercial aviation celebrated its 10th birthday on February 5th, 1929. During the war a company, the Deutsche Luft-Reederei, had been founded in order to take preparatory measures for the inauguration of a regular air traffic after the war. With a few slightly altered military planes, this company opened a regular service on February 5th 1919, between Berlin and Weimar, where the German National Congress was sitting. It is a long way from this single short route flown with a few old planes to the network of airlines all over Central Europe over which the Deutsche Luft-Hansa, successor of the Luft-Reederei, is flying today with the most up-to-date cabin planes.

THE service Teheran-Kas-i-shirin of the Persian Junkers Luftverkehr Co. will be extended as far as Baghdad this summer, beginning in April. The negotiations between Junkers and the Iraq government have been concluded, and a connection with the Imperial Airways service Cairo-Gaza-Baghdad-Basra (which is to be extended to India this year) will be secured.

A FEW weeks ago it was reported that Captain Kohl and Colonel Fitzmaurice were to make a new attempt at an east-to-west crossing of the Atlantic Ocean by means of refueling en route. Now it seems that this flight would be only preparatory to a far greater project; the Deutsche Luft-Hansa is negotiating with the North German Lloyd to finance a transatlantic aviation company, in which, however, the German government would play an important part. This company would use heavier-than-air craft.

At the same time the Luftschiffbau Zeppelin is negotiating with the Hamburg-American Line with regard to forming a company for transoceanic traffic in dirigibles. In this company, too, the German government would certainly secure for itself a dominating influence, for it would probably pay a large subsidy for the building of the new Zeppelin hangar and airship. The government of the state of Württemberg will give two million reichsmark, and the Hamburg-American Line one million.

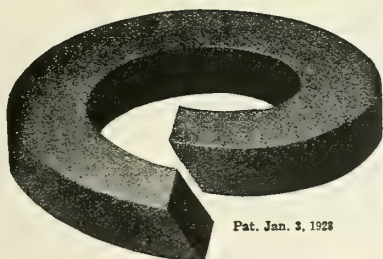
## POLAND

REGULATIONS covering aeronautical activities have been drafted in Poland. The order covers the following phases of aviation; crews of aircraft, and their duties; registration of pilots; placing on public and private property signalling equipment and signs for aircraft; public exhibition flights; air signals and ground signals; safety of aircraft traffic.



De Havilland Hound with a 550 horsepower Napier Lion engine.

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the lock washer that is  
revolutionizing the field  
from any one of 5  
large manufacturers*



Pat. Jan. 2, 1928

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**KANTLINK** TRADE MARK **SPRING LOCK WASHERS**  
**DO NOT TANGLE DO NOT RUST**  
**THEY PAY THEIR ENTIRE COST IN TIME SAVED - SOMETIMES EVEN MORE**



## CANADA

## Canadian Air News

By James Montagnes

**NATIONAL AIR TRANSPORT, LTD.**, of Toronto, ran a daily service between Buffalo and Toronto during the Buffalo Aviation Show.

**A SAFETY** device which should play a large part in the prevention of flying accidents has been invented by R. A. MacLean, a member of the Ottawa Flying Club. Believing stalls to be the cause of the majority of flying accidents, MacLean started on a device to warn the pilot when his plane is approaching stalling speed. The instrument was tested recently on a Royal Canadian Air Force plane. It sounds a note of warning in special ear phones worn by the pilot to tell him when he is flying at near stalling speed.

A simple electrical attachment, consisting of two contacts on what is called a "Rat Trap" air speed indicator on a wing strut, closes a circuit from a small dry cell battery to the phones. A buzz sounds in the pilot's ear, telling him that he must have more forward speed instantly, either by motor pull or diving, or he will stall.

**GENERAL JOHN F. O'RYAN**, who was in the Queen City for several days to make arrangements for airport facilities, stated that the same type of service now offered on the Albany-Montreal route of the Canadian Colonial Airways will be established between Toronto and Buffalo. Sikorsky amphibians will be used. Both Canadian Colonial Airways and National Air Transport, the latter operating the Toronto-Windsor passenger service, have arranged for long term leases at the same airport, the new field on Dufferin Street, Toronto.

**THERE** has been a great deal of winter flying this year in the northern sections of the Dominion. Both for mining and for medical purposes, planes are in the air every day in northern Quebec, Ontario and Manitoba. Some important mineral finds have been made by air in the Crow River territory of northern Ontario. Indian tribes suffering from the flu have been tended by doctors and nurses rushed by government planes. New routes are being opened into the northland, the latest being a passenger and express service from Oxford Lake to Mile 137 on the Hudson Bay Railway. This is a Western Canada Airways route.

**SIoux LOOKOUT** in northern Ontario, on the transcontinental mainline of the Canadian National Railways, claims to be second only to Chicago in the number of commercial airplanes in daily flight. Twelve planes fly on daily routine from there,—four ships of the Western Canada Airways, four of the Northern Aerial Minerals Exploration, Ltd., and four of the Ontario Provincial Air Force. A training school also operates there. Sioux Lookout is one of the hopping off places for the gold fields of the Red Lake and Woman Lake district.

## Montreal Air News

By C. P. C. Downman

**A**N air mail service which commenced on March 25th arrived at Aklavik, in the North West Territories, ten days ahead of the regular mail which left Edmonton on January 22, according to the post office department, which has granted authority to Yukon Airways to carry mail out of Mayo Landing and Dawson City to the far northern post.

The distance covered by the new service is about 350 miles. An additional run of 50 miles to Herschel Island may be tried out on the completion of the first scheduled run. It is hoped that eventually air mail service into this territory will replace entirely the present dog team service in winter and the waterways service in summer.

**A**IR mail service between Montreal and Toronto has not proved successful and will be discontinued unless the revenue derived from it increases considerably in the next six months. Hon. P. J. Veniot, Postmaster General, told director of the Canadian Weekly Newspaper Association at their annual dinner held recently. The Postmaster General made an appeal to the press of both the daily and weekly fields to launch a campaign of publicity to encourage the more extensive use of air mail services by industrial and commercial classes.

**T**HE first commerial air service into the Peace River country was inaugurated in March, when a monoplane hopped off from Edmonton for Grande Prairie.

**CANADIAN COLONIAL AIRWAYS, LTD.**, has contracted with the Sikorsky Company for six Sikorsky amphibians.

The first of these planes will be delivered in April and others will follow at intervals of two weeks.

By the use of these planes Canadian Colonial Airways will be enabled to carry passengers between Montreal and New York City in less than four hours. Their use will also eliminate the taxi run to the St. Hubert airdrome, and the run will be made to Albany in less than two hours.

## Montreal Air Show

**MONTREAL** will hold its second annual aircraft show from May 4 to 11 in the new Stadium building. The show is sponsored by the Montreal Light Aeroplane Club, Inc.

## Western Canada Air News

By C. D. McCabe

**I**N spite of weather ranging from fifteen to twenty-five below zero, members of the Winnipeg Flying Club have been going up daily for instruction and solo work in the club's Moth and Avian planes.

**T**HE Western Canada Airways announced that during the past year its planes have flown over 540,000 miles. Most of this was in Manitoba and Ontario in freight and passenger service to the new

mining areas. The fleet of 33 planes is made up largely of Fokkers, although a new German Junkers plane with a Wasp engine is now on the way.

**T**HE Dominion government has decided to establish a custom airport in Winnipeg, and a survey is being made to decide where it will be located. At the present time it is necessary to wire Ottawa for a landing permit and also wire the customs officer at Winnipeg to meet the planes coming in.

**A**N increase of \$800,000 was made in the appropriation to the Post Office department this year in order to establish an air mail service between Winnipeg and Calgary. It is expected that the new schedule will be, for the most part, night flying.

## British Columbia Notes

By A. F. Roberts

**T**WO Boeing B1E Wasp flying boats have been added to the fleet of the Western Canada Airways, Ltd., this spring following the recent visit of Mr. W. L. Brintnell of Winnipeg, general manager of the firm, who discussed with Major D. R. MacLaren, B. C. manager, the plans for the season's operations. The first of the new ships was flown from the factory at Seattle late this month and the second will be ready for delivery early in April.

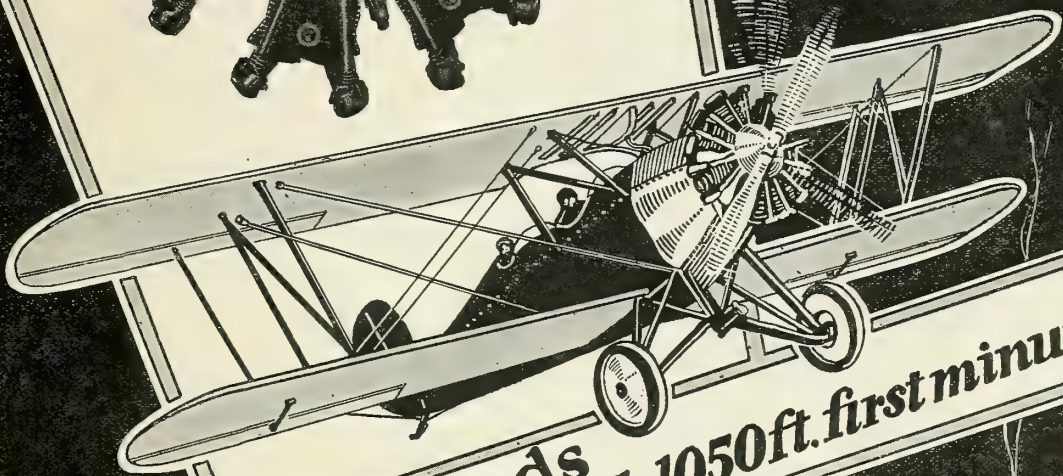
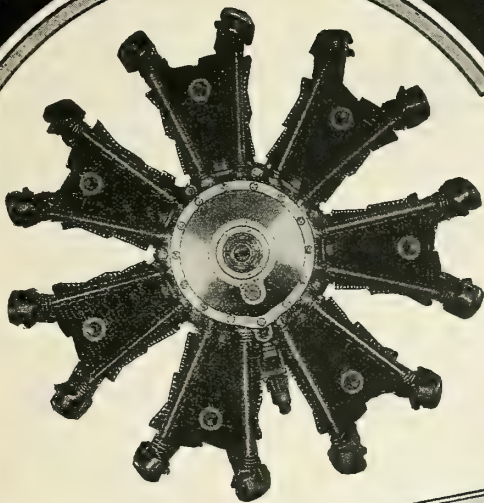
The firm will confine its activities in B. C. to fisheries patrol under Dominion government contract, sketch mapping of forestry areas, photographic flights and similar work. A fleet of five flying boats, four Boeings and a Vickers Vedette, will be available for this program.

**N**EGOTIATIONS are under way for an alliance between the Dominion Airways, Ltd., of Vancouver, and Yarrows, Ltd., well known Victoria shipbuilding concern, for the establishment of an aircraft plant in British Columbia, probably in Victoria. Following the recent visit of Mr. Norman Yarrow to England, where he inspected a number of modern airplane factories, it was reported that an assembly plant will be erected as the first unit. Mr. L. A. Dobbin of Dominion Airways, which is B. C. distributor for DeHavilland Aircraft Co., admitted that negotiations are proceeding but would not announce the nature of the plans.

**R**EQEST that the Dominion government guarantee a loan of \$600,000 to provide funds for the purchase of a 200-acre site for Vancouver's permanent airport on Sea Island has been forwarded to Ottawa by the city council. The North Fraser Harbor Board has undertaken to take charge of development work if the government will assist the city financially. Accommodation for both land and seaplanes is planned. The temporary site on Lulu Island has accommodation for landplanes only.



*The*  
**HESS-WARRIOR**  
AIRCRAFT ENGINE  
*and the*  
**ARGO**  
AIRPLANE

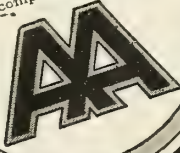


**Takeoff in 5 seconds  
climb 1050 ft. first minute**

POWER and maneuverability are outstanding in the Hess-Warrior powered Argo. Combining in its design high load factors, great stability and simplicity of construction, the Argo is an ideal plane for training, fast messenger service or for the sportsman.

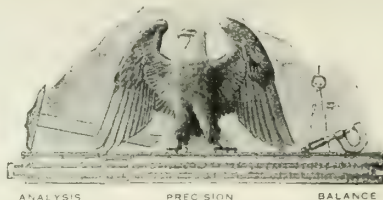
Rugged, smooth, efficient, light in weight, the Hess-Warrior engine develops 125 h.p. And sweet! A wonderful engine.

Built in the same plant, designed as a unit, the Hess-Warrior engine and the Argo plane give performance possible only with completely unified design.



*The* **ALLIANCE AIRCRAFT CORPORATION, Alliance, O.**





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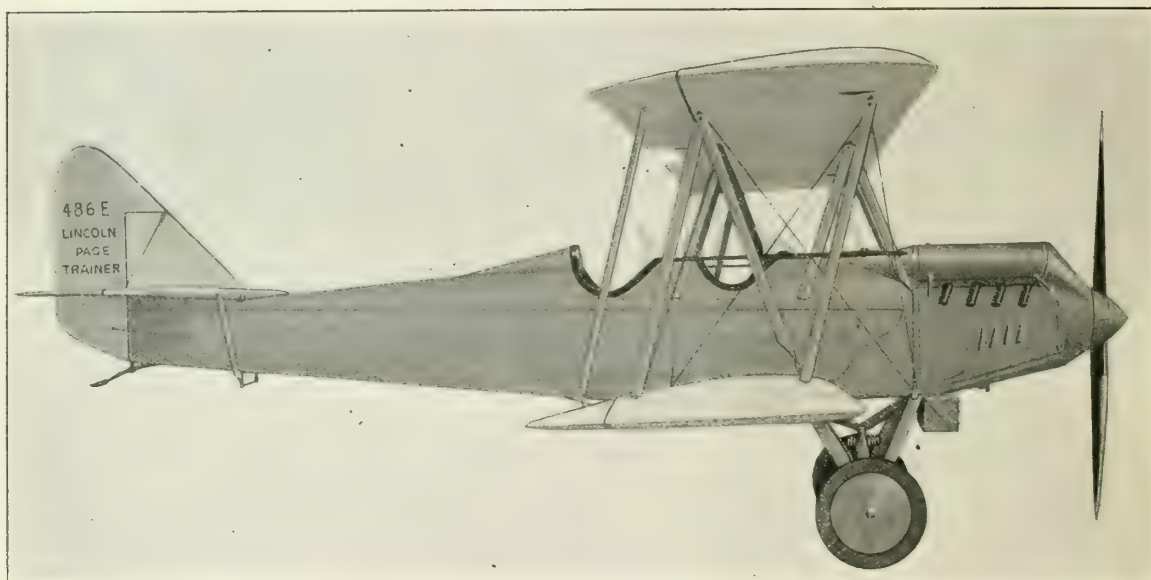


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# Introducing the **NEW** **LINCOLN PAGE** **TRAINER**



**A**T last it's here . . . the Lincoln Page Trainer . . . today the safest, sturdiest, most practical plane on the market! This wonderful achievement of Lincoln Page engineers fills the long felt need of a speedy, dependable plane . . . low in price . . . that can be used for both training and sport flying.

The Lincoln PT is sturdily built to withstand the constant abuse to which training planes are subjected. Stable to an almost bird-like degree, it imparts confidence to the student flyer. Its excellent performance with any motor from 30 to 110 H.P. assures both safety and economy of operation. These outstanding features . . . combined with this plane's surprisingly low price . . . make the Lincoln PT an unusually profit-

able investment for both flying schools and individual flyers.

The Lincoln Page Trainer will be on display at the Detroit Show. A demonstrator will be at Detroit for you to fly and test.

*Price is only \$1,985.00; less motor and prop.*

*An excellent ship in which to use that old OX5 engine you now have in storage.*

### *Territory Open to Dealers!*

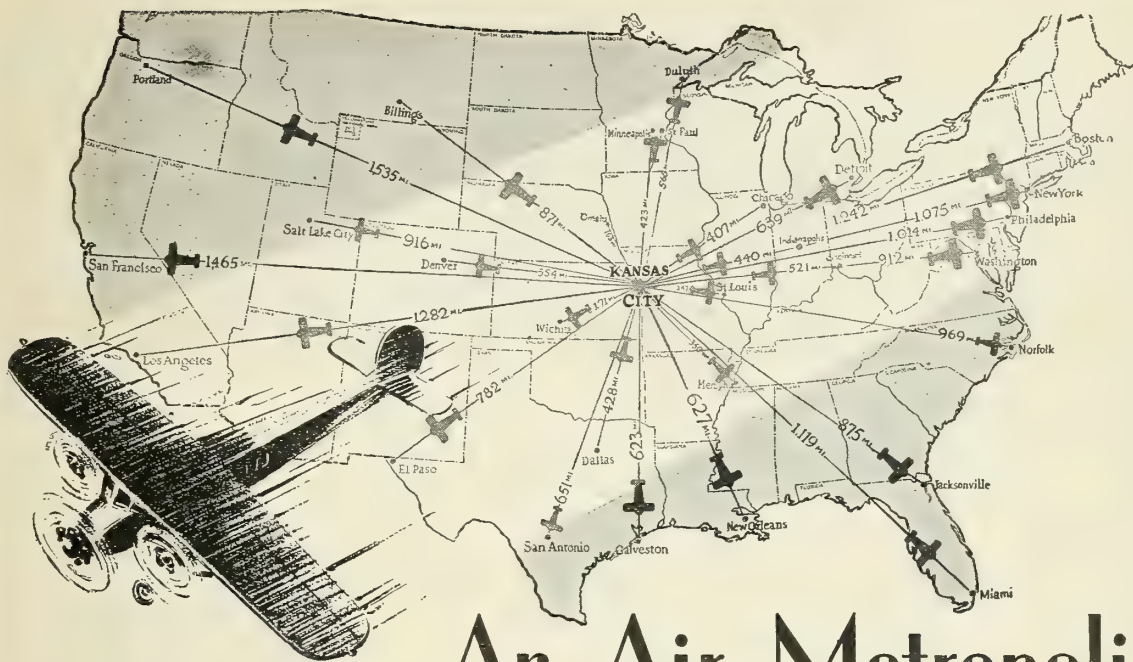
Lincoln Page offers a wonderful opportunity to Dealers. Territories are now open throughout the United States. Write for our unusually generous offer to Dealers, and full information about the Lincoln Page Trainer and commercial type Lincoln Page Airplanes. Write at once while territories are available!

**LINCOLN AIRCRAFT COMPANY, INC.**  
**LINCOLN, NEBRASKA**

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**LINCOLN PAGE AIRPLANES**


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# An Air Metropolis is Determined by Basic Economic Factors

In the last analysis aviation is merely the ultra-modern in fast transportation. Its greatest service is performed in linking communities and cities that are far apart. The air transportation center will be that city which is the hub of vast areas.

The aircraft industry serves transportation and tends to locate its activities at such a center especially when the production, sales and distribution costs of aircraft and engines are less. It is the aviation market place of the nation—the magnet of aviation growth.

## "Nearest by Air To Everywhere"

Literature will be sent only when this coupon is attached to your business letterhead. If not desirous of revealing identity at present, it is suggested that your banker or lawyer may obtain the book for you.

## Not just a city but an empire

Kansas City advertising does not confine itself to corporate limits. Within the territory are raw materials and manufacturing advantages of a highly diversified nature . . . many within the city itself, many in the smaller cities of this rich area. Kansas City undertakes to tell the story of the entire territory to interested manufacturers, realizing that the city prospers only as its outlying territory prospers.

## Outstanding factors in Development of Kansas City

1. Center of Transportation.
2. Close-in Airport—1¼ miles from business section.
3. Economy of Production.
4. Center of Market.
5. Ideal Weather Conditions.

Chamber of Commerce of

# KANSAS CITY

Kansas City, Mo.

Industrial Committee, Room 47  
Chamber of Commerce, Kansas City, Mo.

Please send me without obligation "The Book of Kansas City Facts." I am especially interested in information on the following subjects:

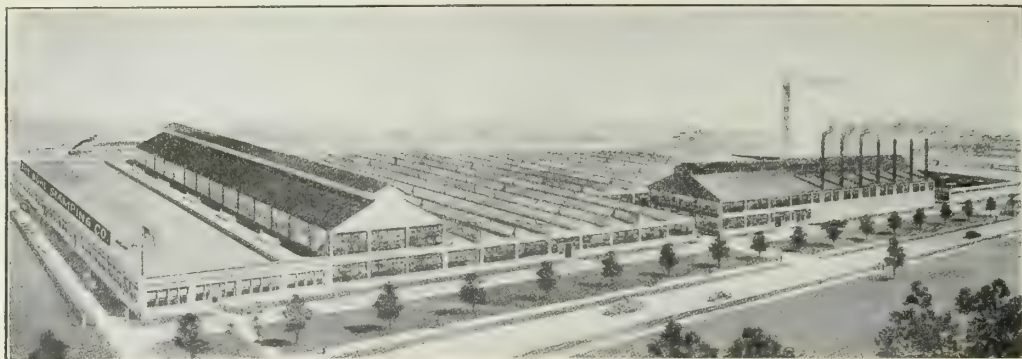
☐ Reduced Production Costs    ☐ Air Transportation    ☐ Flying Schools    ☐ Aircraft Market

Name \_\_\_\_\_ Business Title \_\_\_\_\_

Address \_\_\_\_\_ Nature of Business \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_





# A dependable source of supply

**T**HE Buhl Stamping Company is now producing aeroplane exhaust manifolds, nose cowls and other metal stampings for aeronautical use for the majority of the leading motor manufacturers in the industry.

That such a firmly established enterprise, with such a sound background of continued success, has turned its facilities to the service of the air, assures the aviation industry of a source of supply as dependable as the products which it produces.

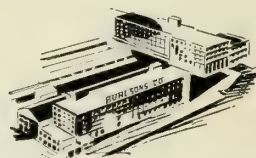
## BUHL STAMPING COMPANY

DETROIT, MICHIGAN

THE BUHL NAME has been identified with progressive industry since 1833. Three generations, and now a fourth, have created, developed and managed enterprise after enterprise—ever pioneering new fields, ever achieving new success.



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AIRCRAFT  
CO  
DETROIT**



**BUHL SONS COMPANY  
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# TRAIN HERE for the BIG JOBS in AVIATION!



Our pilot-instructors and instructors in aeronautical theory are all men of technical training and long experience in aviation.



Marshall is one of the air centers of the middle west. This picture shows a few of the visitors at the Marshall Flying Field on the occasion of a recent exhibition flight.



## This is not a Trade School

The Marshall "College of the Air" is Conducted on a University Basis to Train Men as Pilots and Aeronautical Executives

AMERICA'S great industry of the future—Aviation—demands more than just trade school graduates. The men who direct the making and selling of planes, the men who pilot ships across the world's skyways must be technically trained. Such training is featured in the new curriculum of the Marshall "College of the Air."

The Marshall Flying School, "The College of the Air," is one of the oldest and most firmly established schools of aviation in America. Only here can you get departmentalized instructions in regular courses based on University Methods. Only here can you get training on all the popular types of new training planes—thorough, practical training balanced by a well-taught theoretical instruction.

The Marshall Flying School is affiliated with the Nicholas-Beazley Airplane Co., Inc., America's foremost supply house and manufacturers of the new Barling NB3 Monoplane. "College of the Air" students are in daily contact with the newest and most scientific developments in the aviation field.

Equip yourself now for a place in America's greatest industry. If you are over 16 and seriously interested in aviation as a profession wire or write us today for interesting information and our free illustrated catalog.

Standard training prices: 10 hours, \$245.00; New production prices: 10 hours, \$298.00; Ground School, 600 hours, \$100.00 (Free with Flying Courses).

At Marshall you learn to fly by flying. Practical instruction is given on the field.

600 hours quality ground instruction free with your flying course. An exclusive feature of this school.

### PLEASE USE THIS COUPON

MARSHALL FLYING SCHOOL, Inc.  
150 North English Street  
Marshall, Missouri  
Gentlemen:

I am interested in aviation as a profession. Will you please send me information on your various courses of training.

Name .....

Address .....

## MARSHALL FLYING SCHOOL, INC.

150 North English Street

Marshall, Missouri



Affiliated with  
NICHOLAS BEAZLEY  
AEROPLANE CO.,  
Incorporated



This advertisement appears as a matter of record only.

# 2,000,000 Shares The Aviation Corporation

(Incorporated under the laws of Delaware)

## Common Stock

### CAPITALIZATION

(As of March 7, 1929)

Common Stock (No Par Value) 10,000,000 shs.\*

The number of shares of Common Stock presently to be outstanding will consist of the 2,000,000 shares being publicly offered and any shares presently issued in connection with the acquisition of interests in other companies.

\*Including 1,250,000 shares reserved for sale at \$20 per share under options, granted or to be granted to the organizers, bankers and management, exercisable January 1, 1930 to December 31, 1936, inclusive, the number of shares deliverable upon exercise of these options being subject to increase in case of stock dividends on outstanding Common Stock. A part of these options is to be reserved for executive and technical personnel not yet in the Corporation's employ.

The following information is contained in a letter dated March 7, 1929 from Mr. Graham B. Grosvenor, President of the Corporation:

#### PURPOSE

"The Aviation Corporation has been organized primarily as a holding and development company for the aviation industry. The Corporation aims to make available to its subsidiary and affiliated companies technical and management cooperation, as well as financial resources beyond those which would be at the command of any single unit. While it is anticipated that its holdings will consist largely of the majority of the common stocks of other companies, it may also own interests in companies not controlled. In either case, such companies may be established concerns or new organizations created for experimentation, development, investment, manufacture, sales, or operation of aircraft.

#### TECHNICAL STAFF

Although commercial aviation is already a substantial industry and a factor in the transportation system of the country, experimental and developmental work is still of great importance. It is hoped that this Corporation will play a significant part in the technical and commercial advancement of aviation in this country. It intends therefore to maintain a staff of experts versed in all important aspects of the industry. This staff will cooperate with the active managements of the companies in which the Corporation is interested as well as investigate aviation and related projects, and carry on experimental and development work directly for the Corporation. A part of the options on Common Stock will be reserved for the members of this technical division, which, it is expected, will be headed by Col. Thurman H. Bane, who served in a similar capacity as Chief of the Engineering Division of the Army Air Service, and will include, among others, at the outset Col. V. E. Clark, formerly Chief Aeronautical Engineer, U. S. Army, and C. Fayette Taylor, M.E., (in consulting capacity).

#### ORGANIZATION

The Aviation Corporation is at present negotiating for substantial interests in several large established companies in the field representing various phases of the industry. These acquisitions, it is expected, will be effected in the near future largely through the issuance of Common Stock of the Corporation and, in some instances, options to purchase Common Stock. The Corporation will receive \$35,000,000 in cash as the proceeds of the present financing.

The officers of the Corporation will include W. A. Harriman as Chairman of the Board of Directors, Graham B. Grosvenor as President, Robert Lehman as Chairman of the Executive Committee, and George R. Hann as Vice Chairman of the Executive Committee.

In addition to the above officers it is expected that the Board of Directors will include, upon completion of the present financing, the following:

Frank Andrews, Attorney, Houston, Tex.; L. W. Baldwin, Pres., Missouri Pacific Railroad Company; Harold O. Barker, Jesup & Lamont; William G. Beckers, Director, Allied Chemical & Dye Corporation; C. K. Boettcher, Boettcher & Co., Denver; D. K. E. Bruce, W. A. Harriman & Co., Inc.; Matthew C. Brush, Pres., American International Corporation; Rogers Caldwell, Caldwell & Company, Nashville; Frederic G. Coburn, Sanderson & Porter, New York; W. W. Crocker, Vice-Pres., Crocker First National

Bank of San Francisco; John W. Cutler, Edward B. Smith & Co.; R. Stanley Dollar, Vice-Pres., Dollar Steamship Line; Sherman M. Fairchild, Pres., Fairchild Aviation Corporation; Edward P. Farley, Chairman of the Executive Committee, American Hawaiian Steamship Company; John M. Franklin, Vice-Pres., Roosevelt Steamship Company, Inc.; John C. Grier, Jr., Pres., Guardian Detroit Company; Stanley J. Halle, Halle & Stieglitz; John W. Hanes, Chas. D. Barney & Co.; George M. Holley, Pres., Holley Carburetor Company, Detroit; A. L. Humphrey, Pres., The Westinghouse Air Brake Company; James M. Hutton, Jr., W. E. Hutton & Company, Cincinnati; W. F. Kenny, Pres., Wm. F. Kenny Co., New York; John L. Lancaster, Pres., The Texas and Pacific Railway Company; Robert Law, Barnsdall Corporation; William Dewey Loucks, Attorney, New York; Alan J. Lowrey, Vice-Pres. and Manager, Crocker First Company, San Francisco; C. Townsend Ludington, Pres., Ludington Philadelphia Flying Service, Incorporated; Paul M. Mazur, Lehman Brothers; George Mixer, Vice-Pres., Division of Aeronautics, Stone & Webster, Incorporated; Harry S. New, Formerly Postmaster-General of the United States; Maurice Newton, Halgarten & Co.; Edward J. Noble, New York; Roland Palmedo, Lehman Brothers; Charles M. Parker, Executive Committee, American Radiator Company; Major General Mason T. Patrick, (Retired), Former Chief of Air Service, U.S.A.; Harry C. Piper, Vice-Pres., Lane, Piper & Jaffray, Inc., Minneapolis; Joseph W. Powell, Engineer and Shipbuilder, Boston; Frederick S. Pratt, Vice-Pres., Stone & Webster, Incorporated; Samuel F. Pryor, Chairman, Executive Committee, Remington Arms Co.; J. S. Pyeatt, Pres., Denver & Rio Grande Western Railroad Company; George M. Pynchon, Jr., Pynchon & Co.; Edwin B. Reeser, Pres., American Petroleum Institute; James A. Richardson, Pres., Western Canada Airways, Limited, and Director, Canadian Pacific Railway Company; Alexander B. Royce, Attorney, New York; William B. Scarborough, Hitt, Farwell & Co.; C. B. Seger, Chairman, Finance Committee, Union Pacific Railroad Company; John D. Siddeley, C.B.E., Chairman, Armstrong Siddeley Development Company, Limited, Coventry, Eng.; Lloyd W. Smith, Pres., The Union National Bank, Pittsburgh; Sidney W. Souers, Executive Vice-Pres., Canal Bank and Trust Company, New Orleans; Eugene W. Stetson, Vice-Pres., Guaranty Trust Company of New York; G. H. Walker, Pres., W. A. Harriman & Co., Inc.; Harvey L. Williams, Pres., Air Investors, Incorporated; Robert W. Woodruff, Pres., The Coca-Cola Co.

#### HAZARDS OF INDUSTRY

Although the future of aviation as a manufacturing and transportation industry appears assured, there is no doubt that it will experience many vicissitudes before becoming thoroughly established and stabilized. Many individual companies will probably fail to fulfill the promise now held out for them, whereas new organizations, as yet obscure or not yet in existence, will become strong units in the industry. Moreover, many aviation companies are at present sacrificing the opportunity for immediate profits to the endeavor to prepare their organizations, in personnel, equipment and product, for what they may regard as the future demands to be met. It is believed that a company, such as The Aviation Corporation, with large resources of capital and personnel, will be able to be of constructive assistance to many aviation enterprises in developing their strength and earning power. However, any investment in the industry is hazardous, and must be regarded in the light of a speculation."

This offering was made in all respects when, as, and if issued and accepted by us and subject to the approval of our counsel, at

**\$20 Per Share**

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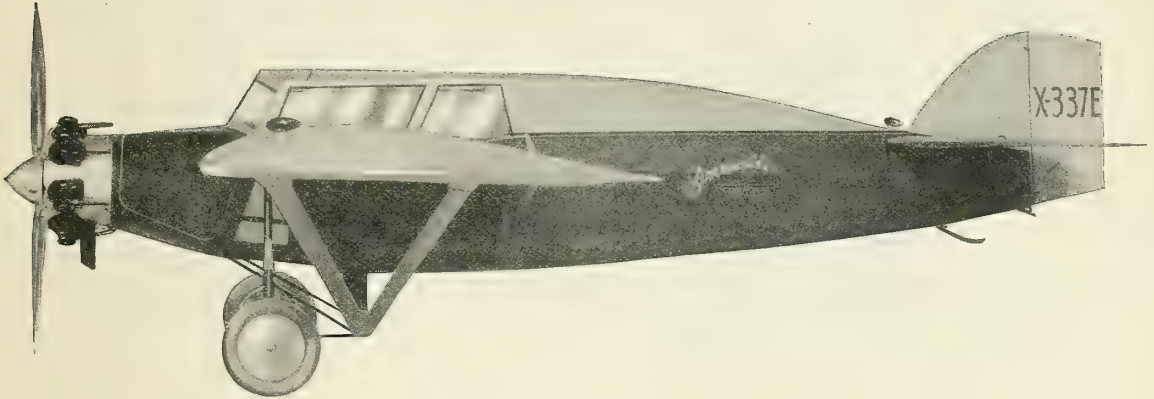
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The above statements are not guaranteed but are based on information which we believe to be correct.

# Invincible

THREE and FOUR PLACE  
CENTER WING  
CABIN MONOPLANE



## Reliability Under Adverse Conditions

In every way, this sturdy little demon of the air has demonstrated her air-worthiness. Matured in a wintry climate, her maiden voyage conquered the most adverse flying conditions. In every subsequent flight and in every test, engineers have stamped her supreme on every count.

Its racy streamline faithfully reflects its very performance. The luxurious cabin designed for three or four place, according to horse power employed. LeBlond 90-H.P. and Curtiss Challenger 170-H.P. motors are standard. Type of any other motor is optional.

Remarkable visibility all around, above and below, roominess and comfort that make flying enjoyable. Dual Wheel Control, either control detachable. Latest navigation, power and lighting instruments are controlled from dash, which is indirectly lighted.

Write today for folder describing new and unusual engineering features of the Invincible and complete specification details.

Three Place, 90 H. P. LeBlond Motor, \$5,500.00.  
Four Place, 170 H. P. Curtiss Challenger Motor, \$7,800.00.  
*Prices Flyaway Manitowoc, Wisconsin.*

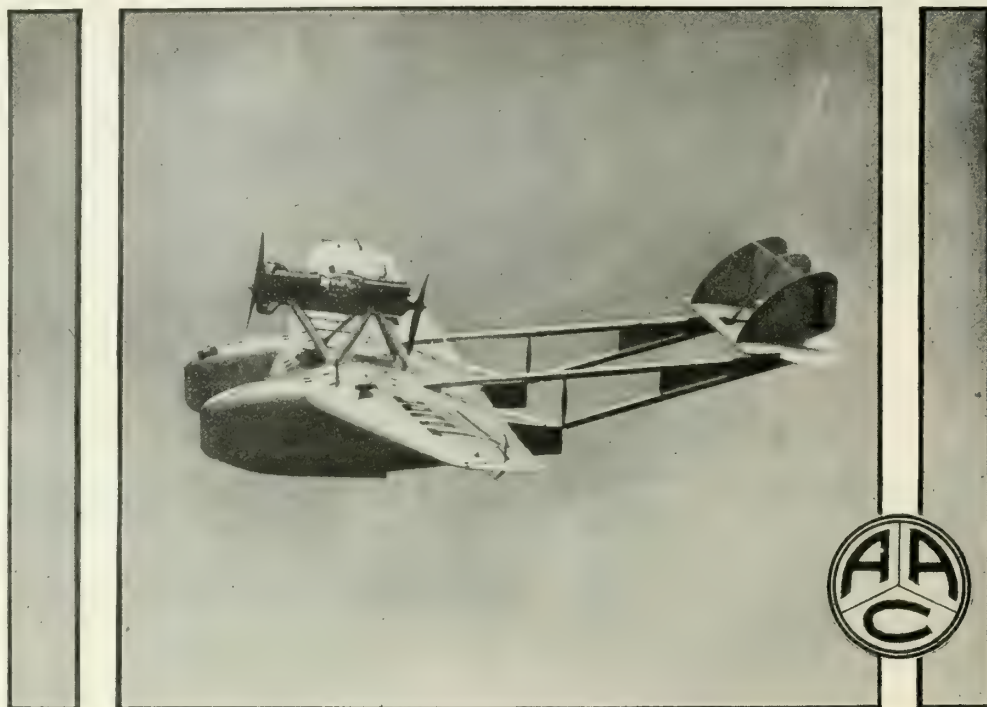
"It's A Bird"



For Information, Address the AIRCRAFT DIVISION  
of the

INVINCIBLE METAL FURNITURE CO.  
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*Photograph shows Model S-55 in flight*

American Aeronautical Corporation will produce SAVOIA-MARCHETTI seaplanes and amphibians under the name of AMERICAN SAVOIA-MARCHETTI.

## SAFE SEAPLANES

Two outstanding achievements of these planes are:

Commander de Pinedo's sixty thousand mile flight around the world, crossing the Atlantic in both directions and touching six continents.

Commander Arturo Ferrarin's non-stop flight from Rome to Brazil, 4,417 miles, in July, 1928, in a Savoia-Marchetti S-64.

AMERICAN SAVOIA-MARCHETTI, S-56, three-seater baby amphibian.

AMERICAN SAVOIA-MARCHETTI, S-62, seven-passenger cabin seaplane or amphibian.

AMERICAN SAVOIA-MARCHETTI, S-55, twin hull, fourteen - passenger tandem-motored, two 500 H.P., seaplane.

*American Aeronautical Corporation*  
*730 Fifth Avenue* *New York*

## DETROIT, 1928 . . . between shows . . . DETROIT, 1929

Standard Steel Propellers have turned over a very busy and eventful year since the last All-American Aircraft Show in April, 1928.

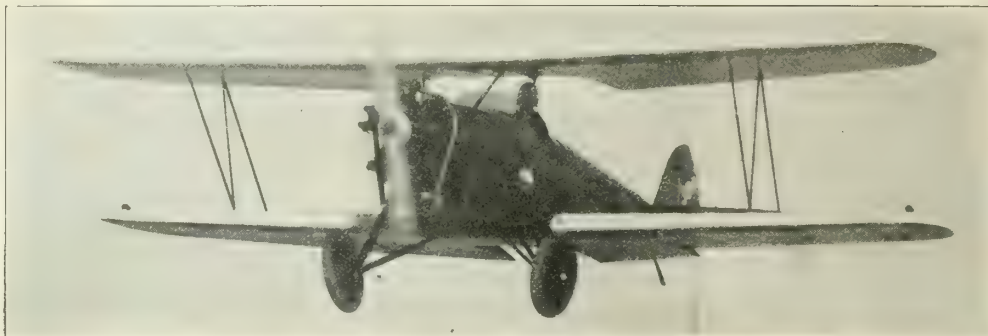
"Friendship"—Newfoundland to England  
 "PN-12"—Naval seaplane records for altitude, speed, endurance and load.  
 C.B.D. Collyer and J. H. Mears—'Round the World  
 1928 National Reliability Tour  
 1928 National Air Races  
 Art Goebel and Harry Tucker—California to New York in 18 hrs., 58 min.  
 C.B.D. Collyer and Harry Tucker—New York to California in 24 hrs., 51 min.  
 "Question Mark" (Center Engine)--Non-stop refueling flight of 150 hrs., 40 min.  
 Capt. F. M. Hawk and O. E. Grubb—California to New York in 18 hrs., 22 min.  
 Wilkins and Byrd Antarctic Expeditions.  
 And millions of miles of every-day all-weather flying with the mail, passenger lines, government services and commercial operating companies.  
*"Follow the choice of experience"*

We will have a booth at the All-American Aircraft Show, Detroit, April 6th to 14th, 1929, with a large exhibit of steel aircraft propellers. Drop in and let's "talk it over".

**Standard Steel Propeller Co.**  
**Pittsburgh, Pennsylvania.**



# THE ARROW SPORT



**A**T Chicago - - a sensation! At New York - - an order for 200 ships placed by the Eastern Arrow Aircraft Corporation! And now we have the Detroit Aircraft Show.

The Arrow Sport will be on display, powered with 60 and 90 H. P. engines.

The plane with Safety and Performance. It will not spin following a stall.

Distributors and dealers should make it a point to see this remarkable ship.

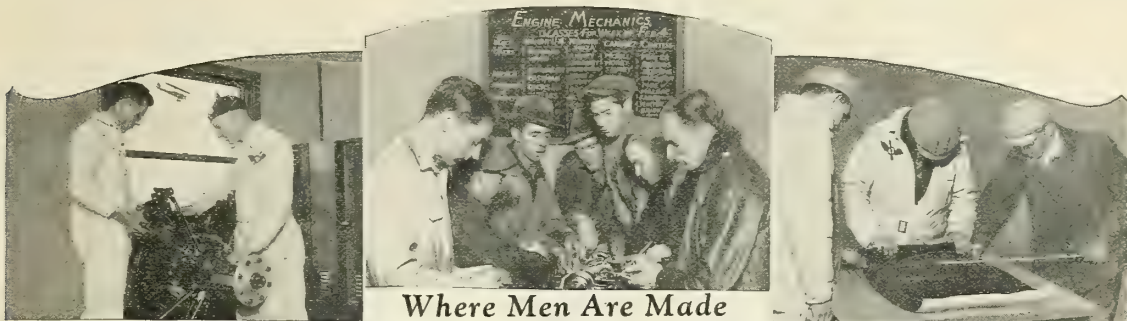
"Watch the Arrow Sport go straight to the Heart of America."

## Arrow Aircraft and Motors Corporation



**Havelock, Nebraska**

*Northeastern Distributors, Eastern Arrow Aircraft Corporation  
5 East 57th St., New York City, N. Y.*



Where Men Are Made

## "ALL THAT I AM OR HOPE TO BE"

*Abraham Lincoln owed much to his Mother. Perhaps it was her great loving sympathy that inspired him to arduous years of study and application—the stern struggle for learning that fitted him ultimately for the Presidency.*

**P**ARKS Air College graduates are more fortunate, science has miraculously shortened the fight for success. They have been trained in the most modern aviation school and can say with similar pride. "All that I am or hope to be" I owe to the decision I made and the help I received." Their pride finds its tangible expression in greater salary and success in the great new industry of aviation.

### THIS IS YOUR OPPORTUNITY!

Aviation stands pleading with you to grasp opportunity by the forelock. Aircraft mechanics, riggers, inspectors, designers, draftsmen, instrument makers, metal workers, woodworkers, and many other highly paid men are needed urgently in the rapidly increasing number of airplane factories springing up over the country.

### POSITIONS PLENTIFUL

4000 commercial airplanes were produced last year in approximately 140 airplane plants always ready to hire trained workers. This year the increase will be tremendous—and next year—and years to come. It is estimated that the value of commercial airplanes sold in the United States this year will exceed \$75,000,000.00. This enormous fleet of airplanes must be built by trained men.

### THINK WHAT THE FUTURE HOLDS

A position in an airplane factory is only the start for a man of ambition. Think what the future holds in the nature of high priced executive positions in transport companies, mail lines, photographic work, mapping, prospecting, as airport managers, and in private flying. "He who hesitates is lost." "Time and tide wait for no man." This is your opportunity knocking.

### DECIDE NOW

There are already eight transport companies with sixteen thousand miles routed and five thousand more miles in various stages of preparation, with at least thirty new companies under promotion, as well as the thousands of airports springing up all over the country. You are needed now. "All that you may be" depends upon your initiative—your immediate decision.

### PARKS AIR COLLEGE LEADS

Parks is the largest and most completely equipped air college in the United States. When you graduate from Parks, every airline operator, airplane factory executive, and airport manager will know that you are thoroughly trained. They know the thoroughness of Parks training and have confidence in Parks graduates.

### THE VERY BEST EQUIPMENT

Parks equipment includes everything in modern power plants: Whirlwind, Liberty, Caminez, Velie, Hispano-Suiza, OX5, and other famous engines are demonstrated and explained in regular class room instruction.

### YOU DO ACTUAL WORK ON AIR MOTORS

You tear down the air motor and rebuild it. You test it under the eyes of experienced instructors. You learn every operation of complete shop practice, including welding, brazing, metal, working and woodworking.



On the Threshold of a Promising Career



270-O Mo. Theatre Bldg.  
**ST. LOUIS, MO.**  
Cable Address: PARKSAIR

Member Aeronautical Chamber of Commerce

### YOU WILL REBUILD AN AIRPLANE

The science of Aerodynamics is demonstrated, explained and proven for you in the rebuilding of an airplane. The four months course follows a carefully standardized curriculum with no detail left undone that will produce within you the power to command *big money* in this great new industry.

### WHEN YOU COME TO PARKS

You will find at Parks a camaraderie of spirit, a loyalty and pride, a courage and enthusiasm that has always marked the "man of the air." In the dormitories and recreation rooms, the thrill and adventures of the sky are re-enacted again for the buddy who cares for the plane, tunes the motor and swings the prop. His is a position of high honor and respect in the aviation fraternity—a position vibrant with life and interest—rewarded with high wages and opportunity. Now is the time. Send for our illustrated booklet. "The Man Who Tunes the Plane." It describes and pictures Parks Air College thoroughly. Fill in the coupon now.



15 Minutes from the Heart of St. Louis

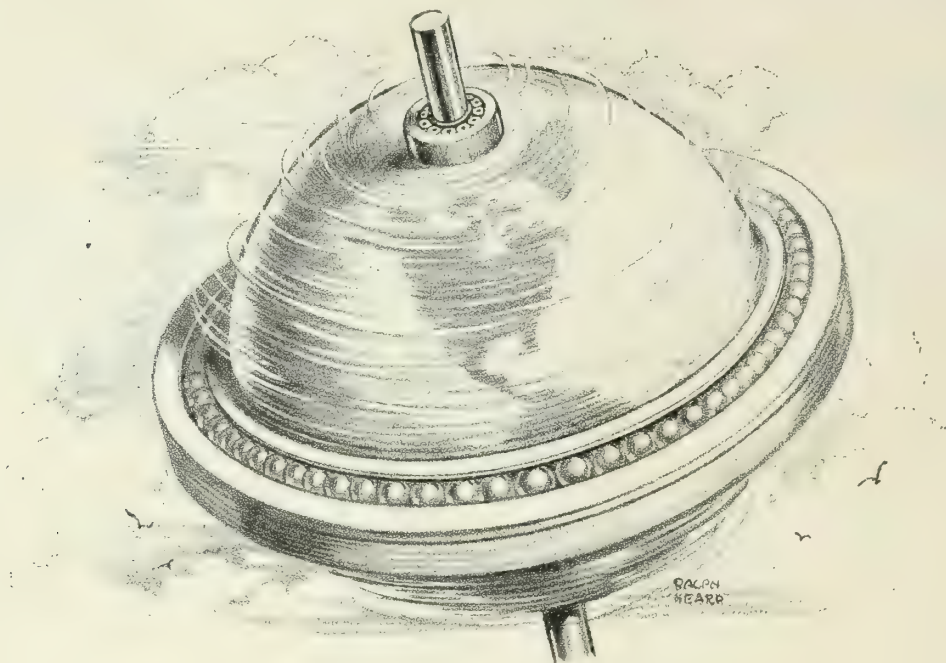
**PARKS AIR COLLEGE, Inc.**  
270-O Mo. Theatre Bldg.  
St. Louis, Mo.

Send me "The Man Who Tunes the Plane," and full information of your special offer.

Name.....

Address.....





## Bearings and Grinding

≈ world efficiency and high speed

**T**HE world's precision machinery and fast-moving engines of land, sea and air depend for their efficiency and speed on ball and roller bearings. Anti-friction bearings by the millions are being produced in great plants employing thousands.

One of the major production operations—one that has made ball and roller bearing accuracy possible is "grinding." Batteries of Grinding Machines are to be found in every ball and roller bearing plant.

Many of these plants are equipped with Norton Grinding Machines. Many of them use Norton Grinding Wheels and Alundum Polishing Abrasives.

Norton Research Engineers, Chemical Engineers, Mechanical Engineers and Sales Engineers are serving countless industries in precision production, meeting present production needs and studying into ways and means of bringing about greater accomplishment in the days to come.

NORTON COMPANY

WORCESTER, MASS.

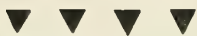
# NORTON

Grinding Wheels  
Grinding Machines



Refractories-Floor  
and Stair Tiles

# Time has Written LAIRD'S best Testimonial



The first LAIRD Biplane, 1912

**F**EW AIRPLANES can boast the ancestry of the LAIRD-WHIRLWIND. As long ago as 1912, the first LAIRD biplane was created. It is a far cry from this pioneer of the air-planes to the modern LAIRD-WHIRLWIND.

LAIRD Airplanes have been in commercial service long enough to be time-tested and proved. One LAIRD-WHIRLWIND on the Chicago-Minneapolis mail route covered upwards of 70,000 miles and was *never off the run for repairs of any kind*. Other privately owned LAIRD-WHIRLWINDS have been in continuous service, one with a total in excess of 300,000 miles to its credit without major repairs.

Recently Chas. ("Speed") Holman of Northwest Airways piloted his LAIRD LC-R from Minneapolis to Chicago, covering the 350 miles in 1 hour and 48 minutes.

See the  
▼ LAIRD ▼  
Exhibit at the  
**Detroit Show**  
**April 6-12**

The history of LAIRD-WHIRLWIND includes:  
*The record non-stop flight between Chicago and New York.*

*A dawn-to-darkness flight between Miami, Fla. and Chicago.*

*1st and 2nd place in the Class "B" 1927 National Air Derby, Chicago to Spokane.*

*2nd place in Class "B" 1928 National Air Derby, Chicago to Los Angeles.*

*1st and 2nd place in Los Angeles-Cincinnati Air Derby, September, 1928.*

These are high-lights. By consistent performance in government, commercial and private use, the LAIRD-WHIRLWIND has justified a reputation for *speed and dependability*. LAIRD superior design and LAIRD superior workmanship plus Wright Whirlwind power result in the perfected flying unit.

LAIRD airplanes are built for the commercial buyer whose chief interest is high efficiency and dependability rather than price. We invite

such buyers to write for our free booklet and the name of nearest distributor who can arrange a demonstration.



The Newest LAIRD—Whirlwind LC-B, 1929

## E. M. LAIRD AIRPLANE COMPANY

Ashburn Field—4500 W. 83rd St., Chicago

*Laird airplanes are manufactured only by the E. M. Laird Airplane Co., Chicago, Ill.*



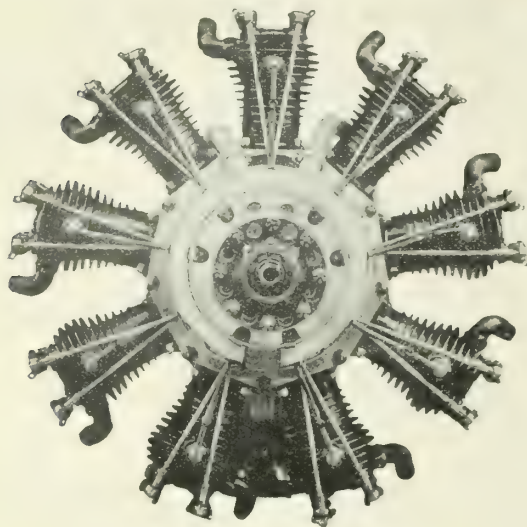
**Distributors:** Exclusive territories available for established firms with funds and suitable demonstration facilities to handle LAIRD sales. Enlarged factory space and increased production facilities insure prompt delivery.

LAIRD AIRPLANES LEAD THE FIELD



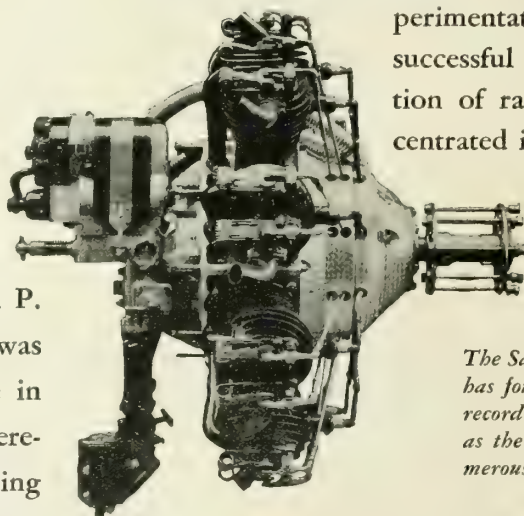
## The SALMSON AD9

### Now Available for Immediate Delivery

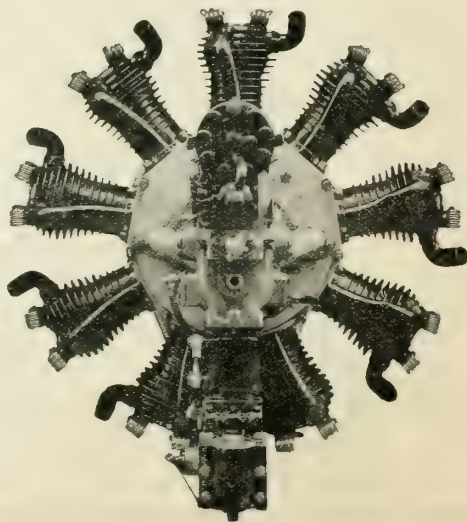


*All Salmson AD9 engines are built to a standard, and backed by an organization which pioneered the radial type of aircraft engine.*

The Salmson AD9—40 H. P. radial air-cooled engine—was originally designed for use in light touring planes, and is therefore especially suited for training purposes. As on all radial engines built by the Societe des Moteurs Salmson, the cylinders are anchored individually to the crankcase by studs, making each cylinder as well as the connecting rods, pistons, valves, rocker arms and other parts interchangeable. The Salmson AD9—the popular and proven engine in the light plane field—is distributed exclusively in the U. S. A. by the **Aeromarine Klemm Corporation, Paramount Building, 44th Street and Broadway, New York City.**



*The Salmson AD9 engine has four years' successful record of practical service, as the power unit in numerous types of European light planes.*





**DOUGLAS - ROLFE**

## A NEW CABIN PLANE OF UNIQUE DESIGN

Mohawk presents a smart, new, two-place cabin plane—unusually dashing in appearance and amazingly efficient in performance, combining all the distinct advantages offered by the low-wing type monoplane.

This, and other types of Mohawk planes, will be exhibited at the All-American Aircraft Show, Detroit, April 6th to 14th. Write for descriptions and specifications.

**Mohawk Aircraft  
CORPORATION**

2639 Delaware St., S. E.  
Minneapolis, Minn., U. S. A.



# A Vital Message to SCHOOLS

**Cut Instruction Prices... yet  
Double-up on Profits!**



**You Can  
Do It With**

*The Monoprep*

**Especially  
Designed  
for  
Economical  
Training**

**M** AINTENANCE and operating costs of the MONOPREP are but a mere fraction of the expense attached to the average training plane.

That's why schools with Monopreps on the line can offer student training for less money and still enjoy larger profits than their competitors.

Often the same purchase money puts two *Monopreps* instead of a more expensive plane into service, which means two students in the air during the same hour. The side by side training permits the instructor to cover each lesson thoroughly *while the student is in the air*. This feature alone saves hours of time.

The MONOPREP embodies every qualification desired in a training plane.

*Inquiries are invited for distributor  
and dealer franchise contracts. Write  
or wire today for full information.*

**MONO-AIRCRAFT, Inc.**

Builders of the Monocoupe, Monocoach and Monoprep  
Moline, Illinois, U. S. A.

## Note these Monoprep Features—

Perfect vision all directions.  
Oilhydraulic landing gear struts.  
Two doors.  
Frieze type ailerons.  
High lift wing.  
Slow landing speed.  
Gas consumption 4 gals. per hr.  
Five hours fuel.  
Flyaway price \$2675.

**Increased Enrollment  
Accrues to the School  
with the MONOPREP**

# An Entire Aviation Course in Two Great Books

Richard Arlen in  
"Wings," Courtesy  
Paramount Pictures.

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These two up-to-the-minute authoritative volumes on Aviation bring you a comprehensive aviation course between the covers of two inexpensive books. **EVERYBODY'S AVIATION GUIDE** brings you 600 questions answered—a text for laymen, students, beginners and enthusiasts, and **MODERN AIRCRAFT** covering every type of aircraft, their construction, operation, control and flight completes the information every aviator, builder, mechanic or ground-man requires.

Written by the well-known Major Victor W. Pagé, U. S. Air Corps Reserve, and member S. A. E., you get the years of technical practical experience of a pioneer designer, an excellent instructor, and an authoritative engineer.

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**Modern Aircraft** is used as authentic reference and text book everywhere. Recently published. Invaluable to pilots, mechanics and aviation officials. Explains every aircraft detail—engines, instruments, flying, airports, modern

planes and dirigibles, etc. 400 Illustrations. 23 Tables. 855 Pages. Price \$5.00.

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This convenient coupon brings either one or both of these great books to your address. Look them over for five days. If not completely satisfied with them, return the shipment for complete refund. Clip and mail the coupon at once. Do it now. Norman A. Henley Co., Dept. 4, 2 West 45th St., New York, N. Y.

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2 West 45th Street, New York, N. Y.

Gentlemen: Please send the book (or books) checked below. With the understanding that I have the privilege of examining the shipment for five days, I will give the postman the purchase price and postage as a deposit. If not satisfied, I will return the books and you will refund my money. Otherwise, I will keep them and not pay you another cent. Check here—

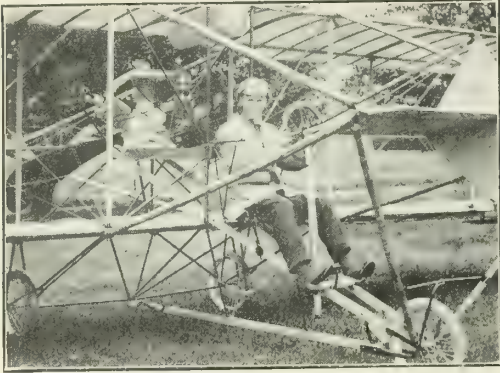
- ☐ Send Both Books. (Check below for one Book)  
☐ **EVERYBODY'S AVIATION GUIDE**, \$2.00  
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Send to.....  
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NOTE—If you enclose remittance with this coupon, we will pay postage charges and allow you the same generous 5-day return privilege. (No C. O. D. shipments to Canada or foreign countries.)

**Everybody's Aviation Guide** teaches aviation from the beginning. Gives and answers 600 important questions. Contains much information necessary for U. S. Government license. Explains every problem up to first trial flight. Indispensable to students and beginners. 247 Pages. 140 Illustrations. Price \$2.00.





C. W. Timm, 18 years ago



**TIMM**

*Collegiate*

**MONOPLANE**

**TIMM AIRPLANE CORPORATION**

**901 N. San Fernando Rd.  
Glendale, Calif.**

# SAN ANTONIO . . . . . THE WEST POINT OF THE AIR



Fleet of American Eagles at Factory, ready for delivery to SOUTHERN AIRWAYS, INC. and SAN ANTONIO AVIATION & MOTOR SCHOOL, distributors for Texas and Mexico. We keep sufficient equipment at all times to give you your flying speedily and efficiently.

We are large enough to give you the best there is in personnel and equipment, old enough to give you the advantage of our ten years of successful experience in airplane manufacture, transportation and pilot's training, but small enough to take a personal interest in YOU.



Ideal Field—Perfect Flying Climate—New Licensed Equipment—Licensed Instructors—Practical Shop Work—Access to Uncle Sam's Immense Flying Fields.

## Honest, Sincere Instruction Under Trained Experts

HOME STUDY COURSE.....\$15.00

PRACTICAL SHOP COURSE..... 50.00

SOLO COURSE (Not over 10 hours) .....\$150.00

Terminating in one hour solo flying. Time required, approximately one month.

ADVANCED or 15-HOUR COURSE .....\$250.00

Time, approximately six weeks.

PRIVATE PILOT'S COURSE, 20

hours .....\$325.00

COMMERCIAL PILOT'S COURSE .....\$750.00

Time, approximately ninety days.

TRANSPORT PILOT'S COURSE .....\$2,000.00

Two hundred hours.

Board and room can be obtained for prices varying from eight and ten dollars per week up.

References: Guaranty State Bank; S. A. Chamber of Commerce. We will refund Railroad Fare or its equivalent to all Commercial and Transport students registering before June 1st.

## SAN ANTONIO AVIATION AND MOTOR SCHOOL

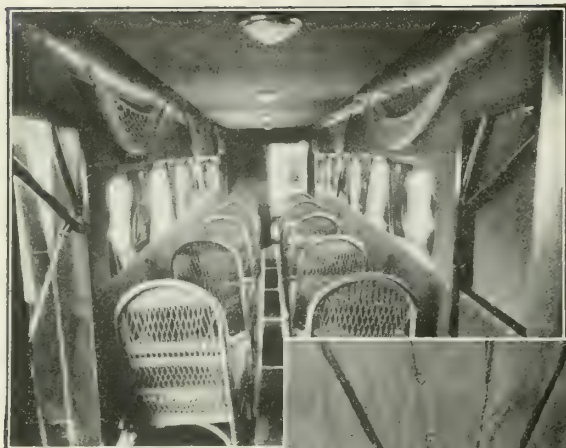
*Affiliated with*

Southern Airways, Incorporated

Texas Bank Building

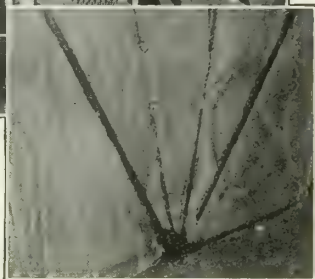
San Antonio, Texas





Interior of Keystone Cabin

## Quiet Cabins



Balsam-Wool Tucked Into Cabin Walls

**tho motors roar outside!**

**T**HROBBING, roaring motors may speak eloquently of power. But unless the roar is absorbed and quieted it is decidedly unpleasant for passengers.

With a blanket of Balsam-Wool built into the cabin, the deafening motor noise is reduced to a low drone. Conversation is easy in ordinary tones.

More than this, the heat-stopping value of Balsam-Wool will keep the cabin comfortably warm even in severe weather or at high altitudes.

Balsam-Wool is light, efficient, flexible and fire-safe.

More and more plane manufacturers are using it to give greater cabin comfort.

### WOOD CONVERSION COMPANY

Insulation Division—Weyerhaeuser Forest Products

Mills at Cloquet, Minnesota

Industrial Sales Offices

Chicago, 360 N. Michigan—New York, 101 Park Ave.

Washington, D. C., 531 14th St., N. W.

Detroit, 3084 W. Grand Blvd.

# Balsam-Wool Blanket

*it tucks in*



## AIR HOT AND OTHERWISE

(Continued from page 67)

at the hands of this great Government. This episode is a great scandal in our history.

Just what happened to this bill in the conference which took place a few days before the adjournment is, with many other dark and dismal matters, held secret down in Washington, but one may guess at the black story.

The bill called for a separate promotion list for the Army Air Corps. When it was first sent over to the Senate, every good clause was taken out of it, and for these was substituted the Reed Amendment, which had no bearing whatsoever on the original bill as asked for by the Air Corps, and as expressed in the original term of the Furlow Bill.

Rumor has it that certain of the conferees were willing to accept what the Senate Military Affairs Committee offered to give,—but why? It would not have helped the Air Corps; nor was it what they had asked for, or what it needed, honestly and rightfully, or what the House unanimously intended it should have.

So the bill, badly maimed in the house of supposed friends, died of its wounds—an ignominious death.

Very ugly rumors suggest a barter for exalted and profitable civilian positions. Time and waitful watching alone will answer natural inquiries. And this process, be it understood, will be far more watching than waitful! But the separate promotion list will not be forthcoming until the next Congressional session.

We may observe at this point that the Army Air Corps' best friend, Congressman W. Frank James, of Michigan, was one of the conferees. James has backbone, front-bone, and middlebone. He knows what the Air Corps asked for and why, and the fact that the conferees could not agree is proof that those from the Senate were unwilling to give it these reasonable essentials to its service in the interests of the nation's proper defense. Congressman James will see to it that it gets these things through the new Congress before any other promotion list gets even a look into the House for its consideration.

## KITE-FLYING AND BLUE SKY

(Continued from page 54)

lot of paper money. Not being of a greedy disposition, I resolved to sell out at forty and let somebody else worry. But as it happened the stock got stuck at 39 and then began to lose altitude. This was very embarrassing. I knew what to do when a stock went up, but I hadn't any idea what to do if it went down, particularly when it went down much more rapidly than I could get used to it. So at last it went into a tailspin and I fell out landing without benefit of parachute on the financial sidewalk, minus my shirt. The stock went clear down to 14 before it was satisfied, but long before then I had lost interest in the subject. So that was the end of my financial career.

Just at present I feel rather comfortable at the thought of not having any money to spare for speculating, quite apart from the trouble it saves me with the Income Tax collectors. If I had some I wouldn't know what to do with it, except that I would be practically certain to do the wrong thing. The world is full of temptations for optimists.

My natural and acquired passion for aeronautics, for instance, would get me into a peck of trouble. I know that this business is going on and up, and that a lot of money is going to be made out of it by a lot of people. I think it

(Continued on next page)



# FUEL AND OIL TANKS OF ALUMINUM

**T**HE Streloff-Naughton organization is amply qualified . . . . through equipment and personnel . . . . to undertake any aluminum fuel and oil tank job for aircraft manufacturers, regardless of size, type and quantity.

Because we are one of the largest manufacturers of aluminum tanks, our equipment includes the latest types of this kind of machinery. Our personnel is comprised of men who have long been associated with aviation and who are specialists in fuel and oil tank construction.

Because Streloff-Naughton Aluminum Tanks are lightest in weight, leak-proof, non-corroding and durable, a large number of manufacturers of military and commercial aircraft now install S-N tanks exclusively in their planes.

Let us estimate on your blueprint specifications.



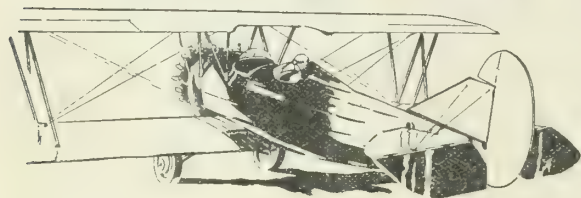
**STRELOFF-NAUGHTON CORP.**

50 WILLIAM ST., LONG ISLAND CITY

NEW YORK



# SAFETY CONVENIENCE



## and DEPENDABILITY in Aircraft Starting

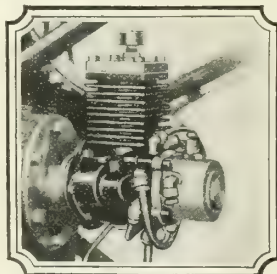
No more propeller spinning, — just pull the trigger, the Heywood Starter does the work every time. High powered aircraft engines are started easily and surely in Tropic heat or Arctic cold.

Experienced pilots and leading aircraft manufacturers are keeping pace with aviation development by installing Heywood Starters on their engines.

They can be easily installed as regular or special equipment on your own plane.

The Heywood Starter trigger located on dash releases compressed air that rotates motor at required speed and injects a carbureted mixture into cylinders in firing order. Unfailing and dependable regardless of weather conditions.

Complete details sent on request.  
Give make and model of motor.



THE HEYWOOD STARTER CORP.  
6547 St. Paul Ave. Detroit, Mich., U.S.A.

SAFE  
DEPENDABLE



POSITIVE  
CONVENIENT

# HEYWOOD self STARTER

(Continued from preceding page)

would be nice if one of these people should turn out to be me. I can imagine myself taking fifty dollars' worth of some new airline, city airport, motor, fuel or hopeful invention, and selling out someday for enough money to sink a Zeppelin. Whenever I listen to an air-minded stock salesman or look at a prospectus with an airplane on it, my first impulse is to rush off and rob the baby's bank. I want to pawn my watch and chain, and borrow the house-keeping money, so that I can shoot the works on a race in which all the horses seem certain to win.

Nothing keeps a man cold sober so effectively as a perfectly flat pocketbook. My own perpetual condition of financial embarrassment gives me a first-class opportunity to think twice before doing nothing. And I am led to think backwards to the early days of almost every industry that has fundamentally affected the lives and habits of humanity. Back, for instance, to the early days of railroad development or of the automobile, or even of electricity and radio. And if there's one thing certain about all such periods, it is that there has always been a sucker born every minute and two or more to take him across.

When we survey the swift progress of any major industry and note the wealth it has created, we are liable to forget or overlook the financial wreckage that was left along the early tracks and trails. We forget all the fakery and trickery, the bad business and worse morals, the sharp practices and shady deals that are the invariable camp followers of progress. We forget also the pipe dreams and bubbles and all the get-rich-quick schemes which collected around a young business and took heavy toll of innocent pocketbooks.

As I have already suggested, I don't follow the ticker very closely. I have, in fact, practically confined my studies of the market to a single stock, not because I own any of that stock but because it gives me something to look at on the financial page and keeps me gently excited over the significant fluctuations of American business. My particular pet is American Snuff. I take a look at American Snuff every evening. If American Snuff has gone up, I know that all is well with the new administration and getting better; if American Snuff has gone down, I tighten my belt and prepare for hard times. Nobody else seems to care a hoot about American Snuff, but it is my financial barometer and economic guide.

In the course of this intensive study, I have been compelled to notice that even the stock market has lately become air-minded. There are planes and airways and instruments and similar aeronautical accessories spread all over it. All sorts of people seem to be making money by buying and selling fractional pieces of the new industry, even though most of them know as much about aviation as I do about the fourth dimension. The progress of man's mastery of the air is become a commodity of trade and barter, like so much soap and chewing gum.

This is no more than was to be expected, even though it has happened years in advance of most people's expectations. It is probably just as logical that the front pages of the newspapers should be peppered with stories of new aeronautical corporations, mergers, promotions and tall stories told in terms of millions of dollars. It's a poor day when nobody announces a new notion and reason for collecting a lot of other people's money and starting an airway, building an airport, or manufacturing something with wings and a propeller. And they are no pikers about it, either. Unless a proposition is offered in terms of millions, nobody seems to take it seriously.

(Continued on next page)

One of a series of advertisements featuring the 22 manufacturers who have standardized on Aerol Landing Struts.



## THE KEYSTONE-LOENING AMPHIBIAN LANDS ON AEROL STRUTS

It has been the privilege of our engineers to co-ordinate their skill with that of Grover Loening, one of the foremost aeronautical engineers of today.

The Keystone-Loening Amphibian, designed with courage and vision, presented a unique problem in adapting Aerol Struts to the folding under-carriage.

The accompanying close-up view shows how this was accomplished without compromising the remarkable landing performance for which Aerol Struts are famed.

It is the oleo-pneumatic principle of these struts that enables them to

perform so effectively in reducing and smoothing out landing shock and shortening both the landing and take-off rolls.

That Aerol Struts are an accepted performance factor in the industry is amply proven by the fact that 22 manufacturers have already standardized on them and practically all others are recommending them as optional equipment.



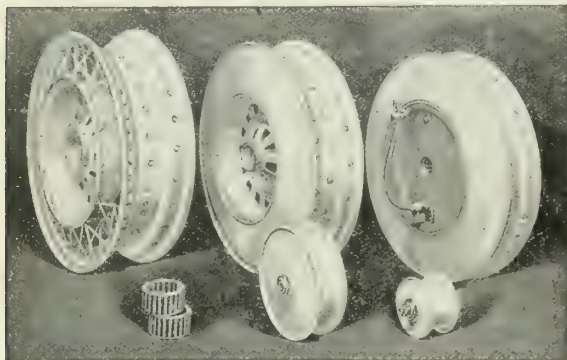
Aerol Struts are manufactured by The Cleveland Pneumatic Tool Co., Cleveland, Ohio. Any requests for information will be gladly received and promptly answered.

*Ask the Pilots Who Land on Them!*

**AEROL** *shock absorbing* **STRUT**



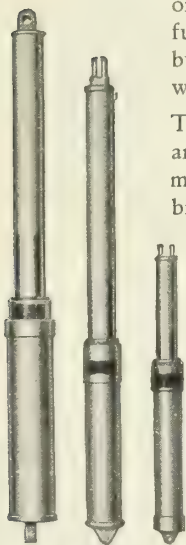
## and this Means something to You



The selection of Aircraft Products Corporation's equipment by leading Aircraft Manufacturers, demonstrates to what extent these producers are striving to give the public the utmost in reliable performance in every phase of aircraft operation . . . . Aircraft Products Corporation's equipment

on airplanes is indicative of a careful selection of materials and parts, by manufacturers who are satisfied with nothing but the best.

The Aircraft Products Corporation are specialists in the design and manufacture of airplane wheels and brakes—Oilraulic Shock Struts—axles, and complete undercarriages—tail wheel assemblies—airplane parts and special fittings . . . the name of Aircraft Products Corporation on airplane parts is a seal of quality materials and a mark of the manufacturing perfection which insures that smooth unerring operation so essential in aircraft performance.



**AIRCRAFT PRODUCTS CORPORATION OF AMERICA**  
DETROIT, MICHIGAN

*Manufacturers of Airplane Parts and Special Fittings.*

# Aircraft Products

CORPORATION



*(Continued from preceding page)*

What's back of it all? First of all, of course, the fact that aviation is at last a going concern, even though nobody is quite sure where it is going. The business is out-growing all its promises, and the plain facts of today are far ahead of the fancy fictions of ten years back. So much has already happened that almost anything is liable to happen, and all progress that is expansive must also necessarily be expensive. It takes money to make the mare go, especially if she is a high-flying beast.

But back of the mania of promotion that has suddenly overtaken a sober industry is something that has no particular connection with flying whatever. The plain fact is that we have a shade more money than we know what to do with, and at the same time we are incurable optimists. We are particularly optimistic about anything that looks like machinery and has to do with speed. Our imaginations are built on the scale of the country in which we live, and any scheme or plan or device that promises to straddle a continent and make neighbors of cities a thousand miles apart has us half-sold before we look at it. In all these respects, aviation appeals to our most characteristic national habits of mind.

Unfortunately for the peace of our pocketbooks, there are plenty of people who know it and have no objection to making capital out of it. They have lately found in aviation a heaven-sent opportunity to separate plain folk from their money and make them like it. It's so easy that there ought to be a law. Maybe there is a law, but it doesn't seem to cramp the act.

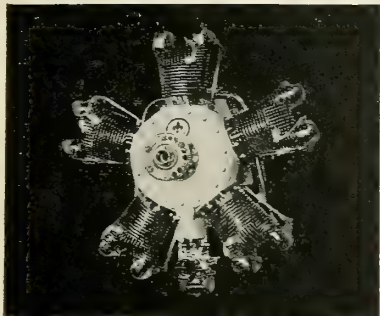
So today we hear on all sides of bigger and better schemes for floating new aeronautical enterprises, many of which have no better foundation than the fact that the people at large are ready and willing to stake their savings on the promise of a new and spectacular industry. It may be a ten million dollar airport in a city that already has three airports. It may be an airline from no place in particular to no place at all. It may be some new device or invention, which—according to the prospectus—will accomplish in one jump what the technical skill of the whole trade has been trying to do for years. It may be a holding company, a financing company, an investment trust, or any of the ingenious arrangements whereby people are persuaded to hand over their cash to others to play with. But whatever it may be, it is the fact that it has an airplane somewhere on its letterhead that makes it dangerous. For the country is in a psychological frame of mind to look for quick and sure profits from the air, and will gamble on it without the first glimmerings of caution and horse sense.

Those who have worked long and faithfully for the up-building of the industry know that the wolves and the bears and the bulls are beginning to come around. They know that they are fundamentally beasts of prey, who have no shred of concern for the useful work of aviation but are only interested in buying and selling it to the public and taking a profit both ways. They know, too, that many men who would shy away from a conservative and business-like enterprise of the air will fall hard and often for kite-flying chances and blue sky promotions. And they know that in the long run this is bound to be bad—very bad—for aviation.

To most of the old guard and early pioneers there should be erected monuments, for the honesty and sincerity with which they have played the game. To such as Colonel Lindbergh there should be one not much smaller

*(Continued on next page)*

# FOR THE MODERN AIRCRAFT MOTOR ALUMINUM INDUSTRIES PERMITE CASTINGS OFFER UTMOST PRECISION AND DEPENDABLE STRENGTH

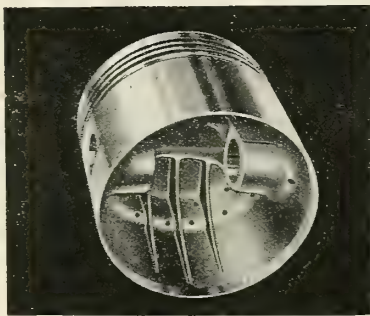


LE BLOND FIVE-CYLINDER AIRCRAFT ENGINE

All the aluminum parts used in the construction of Le Blond engines are Permite castings.

Each individual part offers a problem—these have been worked out by the Engineering Department of the Aluminum Industries, Inc., through the use of Permite aluminum alloy.

The failure of any one part may prove a serious disaster—Permite castings are a good insurance.

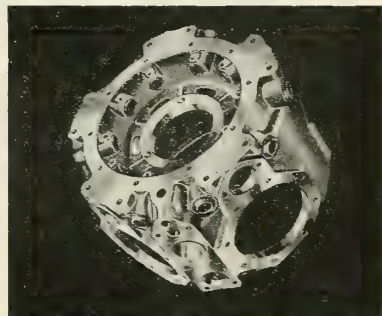


PERMITE ALUMINUM-ALLOY AIRPLANE ENGINE PISTONS

Permite-Permanent Mold Aluminum-Alloy pistons have been selected—only after the most exhaustive tests, which have proved their superiority.

No one part of the airplane engine receives more abuse than the pistons—the efficiency and economical operation of an airplane engine depend almost entirely on the pistons.

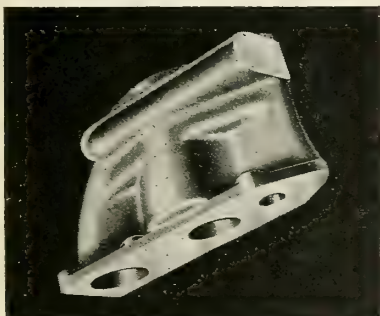
The close grain structure and excellent wearing qualities are assured by Permite Alloy and the Permanent Mold Process of casting.



PERMITE ALUMINUM-ALLOY AIRPLANE ENGINE CRANKCASE

One of the most intricate and difficult aluminum-alloy castings—the airplane engine crankcase is produced by the Aluminum Industries, Inc., of Permite alloy.

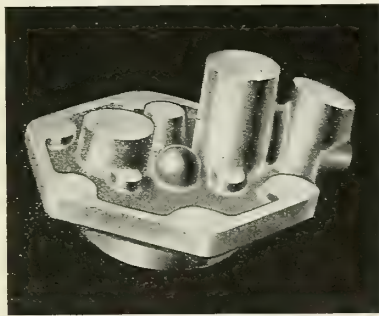
The requirements of such a casting—strength, close grain structure, freedom from porosity and uniformity of sections—are all found in crankcase castings of Permite.



CRANKCASE OIL PUMP

Reliability of the airplane engine depends on good lubrication—a failure of any one part would ruin the entire engine and possibly jeopardize the lives of the passengers.

Soundness of Permite aluminum-alloy castings means freedom from porosity and weakness which would cause such failures.



OIL PUMP LOWER BODY

Oil is force-fed in all radial airplane engines, the oil pump body must be of the highest grade aluminum alloy to insure dependability and lightness—such qualities are found in all Permite castings.



GEAR CASE COVER

Used on airplane engines, requires strength, close grain structure and good wearing qualities—these are dominating factors in Permite aluminum alloy and Permite method of casting.

FOR more than ten years, Aluminum Industries, Inc., have specialized in *permanent-mold* castings....a process which assures precision and uniformity in production, with vastly superior structural qualities. It is an ideal method to give the finely balanced combination of strength and light weight required by the modern aircraft motor.

The castings illustrated were produced for several well-known manufacturers whose motors are of outstanding dependability. *Permite special-formula aluminum alloy* is used. It is a product of our metal-

lurgical laboratories, and was first produced as a piston metal. For many years, in every kind of service, including that of speedway racing at Indianapolis and elsewhere, Permite Pistons have demonstrated the superior quality of this alloy.

Our Engineering Department is equipped to design, test and put in production by the *permanent-mold* or sand casting process, any aluminum-alloy parts for your special requirements. Write us for complete information.

## PERMITE CASTINGS

Aluminum Industries, Inc.  
Cincinnati, Ohio

Detroit Office  
718 Fisher Bldg.

*Aluminum Industries, Inc., will have a most interesting exhibit at the Detroit Aircraft Show, April 6 to 14, inclusive*



(Continued from preceding page)

than the Washington column, since he has quietly and steadfastly denied the use of his name to anything but sound business, though there's not the smallest doubt that he has been tempted by every sort of aeronautical promotion yet devised by the fertile mind of man. There are plenty of men within the industry whose association with an enterprise is a sufficient endorsement. The shady stuff and the blue sky merchandising has almost entirely come into the trade from outside, and that is a condition which will get worse before it gets better.

It's none of my business to be giving advice to optimistic investors, particularly since they won't take it. There are recognized and reliable authorities within the industry whose opinion is really worth something, and most of them will counsel caution in taking up too readily with a stock-selling scheme in aviation. But as an ignorant layman, I have come to my own conclusions, based partly on what has happened before in the history of industry and partly on my recent realization that aviation, like everything else, must grow within the bounds of its own limitations. Even supposing that I ever have any money that needs a home, I shall buy no shares in an airport that owes its existence to the fact that a certain tract of land is no good for anything else. I shall steer clear of air-terminal propositions which are located where few airplanes will ever care to sit down. I shall button my pocket against airways and airlines that are laid out without regard to present traffic and principally because there seems to be a slice of air available that nobody is using. I shall back no inventions that are to revolutionize the industry and art of flying, since if they are as good as that they wouldn't be needing any help from me. Probably I shall pass up thereby one or two chances to get rich quick, but I shall certainly miss thereby a hundred chances to go broke quicker.

It is so much cheaper to stay out of trouble than to get out of it, but we usually don't find it out until we have paid through the nose for the information. Most of us are suckers for one sort of bait or another, and there are some who are all-day suckers and every-day suckers, and for these there is no hope and less help. Four out of five of us have lately had a rush of aeronautics to the head, and not even our best friends can tell us what to do about it. But there is no community so benighted and no individual so forlorn as to have no sources of sound financial advice. It may be the local banker, it may be an experienced and reliable broker, it may be an old-time investor who has long outgrown the infantile appetite for gold bricks. To ask advice in such quarters is as much a sign of good sense as to consult a doctor before taking purple pills from a bottle that has lost its label. If such a financial adviser doesn't know, he knows how to find out, and he will probably lean over backwards in his anxiety to play safe and be sensible. Any layman who will take stock in aeronautical blue sky without consulting some such authority, deserves to be took himself, and probably will be.

The fact that there are so-called brokerage houses that profess to specialize in aviation stocks is no guarantee that the stuff they offer is anything but kite paper. Some of these new investment concerns are worse than the stuff they sell, which is saying something. The same rule applies to them as to the stocks. Anything that is fit to sell can be bought through houses of sound and old-established reputation. Why deal through stock-market bootleggers?

(Continued on next page)



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# Native-Lake Asphalt runways, floors and roofs for use in airport construction

The unusual wear and weather resisting qualities of Native-Lake Asphalt have been proved through a half-century of use as paving material in all parts of the world. This wonder of Nature, dug from the surface of Trinidad and Bermudez Asphalt Lakes, has also thoroughly demonstrated its value

for use in flooring for large areas and in protective roofing through long years of service.

These Barber Asphalt Products adequately meet the needs for runways, floors, and roofs in airport construction, and are particularly recommended when long life and low maintenance costs are required.

## FOR HANGAR FLOORS

**Genasco Asphalt Mastic** is the ideal flooring for hangars. It is resilient—stands up under the wear and tear, and gives lasting service. It is sanitary, non-absorbent, free from dust, and easy to keep clean.

**Genasco Asphalt Mastic** is made from Native-Lake Asphalt combined with suitable amounts of filler and sand. Easily and quickly laid, in one continuous unbroken sheet—as a new floor or over old floors—and it is ready for use in a few hours. Genasco Asphalt Mastic may be laid over wood, concrete, or brick, provided the foundation is solid and there is no excessive vibration.

## FOR HANGAR ROOFS

**GENASCO ROLL ROOFING** and **GENASCO STANDARD TRINIDAD BUILT-UP ROOFING** are two types of roofing which offer complete weather protection for hangars.

**GENASCO ROLL ROOFING** gets its unsurpassed waterproofing wear and weather resisting qualities from Native-Lake Asphalt Cement. The backbone of this roofing is tough, rag felt, selected because of its great tensile strength and power of absorbing the waterproofing saturant. Genasco Roll Roofing is made with smooth surface and also with slate surface. The latter is available in four unfading colors—Red, Green, Blue-Black, or Mix-Tone—and has the additional advantage of being fire-retardant.

**GENASCO STANDARD TRINIDAD BUILT-UP ROOFS** offer still greater durability. The layers of thoroughly saturated long-fibred, all-rag felts, are bound together by Native-Lake Roofing Asphalt, and result in a roof that is noted for its long life and low maintenance cost.



## FOR AIRPORT RUNWAYS

## FOR AIRPORT RUNWAYS

**TRINIDAD AND BERMUDEZ NATIVE-LAKE ASPHALTS** are used for street and road building all over the world. The best form of construction for airport runways at a reasonable cost is Bermudez penetration macadam.

The resiliency of Native-Lake Asphalt makes it withstand the shock from landing planes, and its surface can be finished either smooth or as rough as desired, to assist in preventing skidding.

Native-Lake Asphalt has proved its ability to stand the severest usage and is attractive, dustless, noiseless, and easy to keep clean and in repair.

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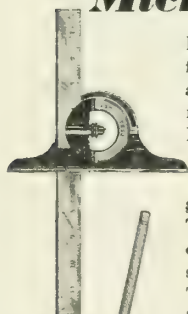
## No chances are taken when using a Starrett Micrometer No. 230

Measurements by thousandths of an inch, from 0 to one inch, can be made with accurate control by using a Starrett Micrometer No. 230.

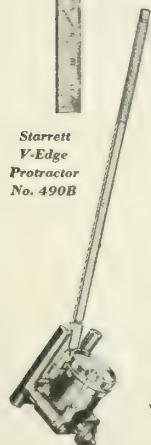
Precision work is responsible, to a considerable extent, to the reliability of a motor from the time it's "given the gun" until "cut" at the end of the trip.

The Starrett Micrometer No. 230 combines easy reading—quick adjustment—ratchet stop—lock nut—and of course, solid anvil. These are the features that have made Starrett Micrometers famous for accuracy wherever motors are built or overhauled. Send for the Starrett Catalog No. 24"AD" which describes over 2500 Starrett Tools. A copy is worth having for reference.

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# Use Starrett Tools

2748

(Continued from preceding page)

Our benevolent Government provides in the Income Tax blank a special section for listing losses from investments. Next year, unless all signs fail, there will be a lot of entries in this section, and a lot of them will be blamed on aviation. As a matter of fact, most of them will be the consequence of greed, gullibility and ignorance, and aviation will be the scapegoat. A sucker is a sucker, no matter what he sucks, and there is no cure for him but experience. It's just too bad that he can't be prevented from losing his shirt right in aviation's own back yard.

## WHERE THE SUNSHINE SPENDS WINTER

(Continued from page 40)

arrive at our stated destinations? Don't put the railroads out of business, boys—they're the only way I ever get anywhere. Not that I call Lunken Airport, Cincinnati, anywhere, because it isn't, just now. It's nowhere that you can see; for it has become part of the bottom of the Ohio River, which is now in flood. On my way back here, a week ago, I could just discern Embry and Riddle, marooned at the office, with only their heads above water, sending out distress signals. What they need on that airport is a Volga Boatman. They started in to build a dyke around the place, and when I saw the big dyking machine last, there was only the top of it above the flood. The only thing to do now is to turn the thing into a fish hatchery, buy an amphibian, and send fresh fish to the Cleveland market. Try that on your airport, John Paul.

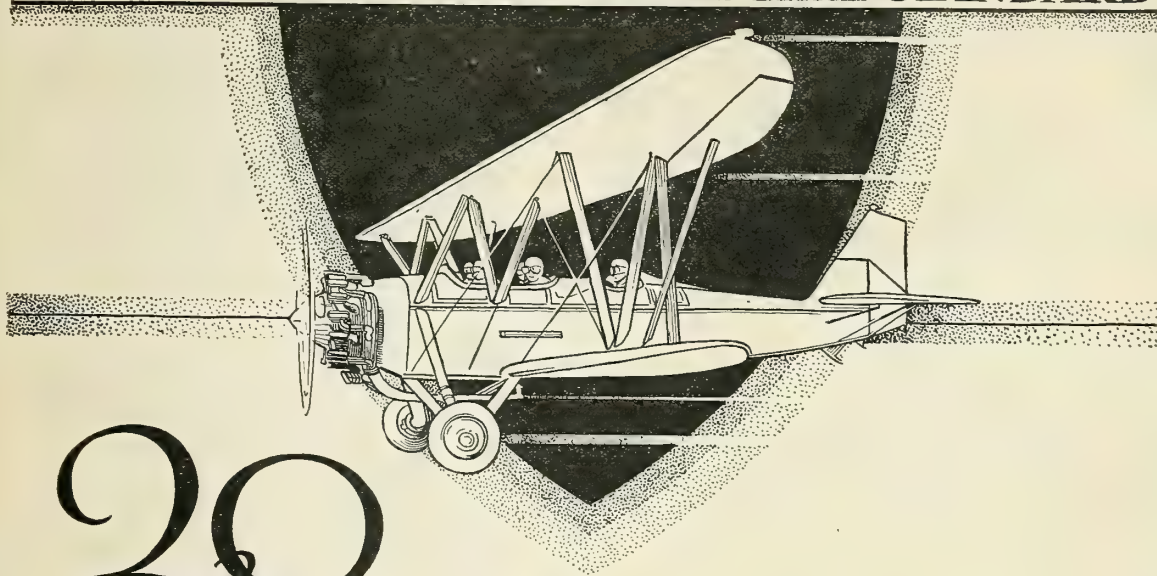
However, it was all right on our flight down South. We landed to gas up and received the usual good treatment you get from Embry-Riddle Co. Next year the boys will be all right, for they'll have that dyke built. Meanwhile it gives Charlie Planck something to do explaining to the newspapers how the water came to get there. Charlie's very ingenious; he told the boys they simply wanted to wash off the grass and the wheels of the planes. And in case the Watson Brothers think they're more than 1% up on Lunken with Grisard Field, I'll remind them of the horrible time I had trying to drag my tail out of their mud. And Parks needn't tell me it was only on account of a heavy dew, either.

This whole airport problem is a problem. One solution of soft fields in wet weather seems to be to cover the things with cinders or slag and bind it all together with Tarvia or some such preparation. Hundred-foot runways with a four-inch crown, and the shoulder sloping off into the mud of the field, would not be a hazard even if you landed across them. In dry weather the whole field would be available and in wet weather the runways would be life-savers. I wish Jack Berry would roll over and dream about that some night. There are a few airports in this country—and Cincinnati's and Cleveland's are three of them—that are nightmares in wet weather. But let's move on.

Marion, Ohio, is famous for one thing—it has a \$200,000 memorial dedicated to a dead man, and it hasn't so much as a 20-cent airport dedicated to a living and growing industry. The memorial is a beautiful thing, commemorating the past; but an airport is more useful, for it leads to the future. They build steam shovels in Marion. I suggest they use one of those shovels to lift dead city councillors out of office, and replace them with live ones. Marion deserves an airport and it deserves air mail, and it hasn't either. I always feel depressed when I pass that

(Continued on next page)

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Span of Lower Wing .....	32 ft. 6"

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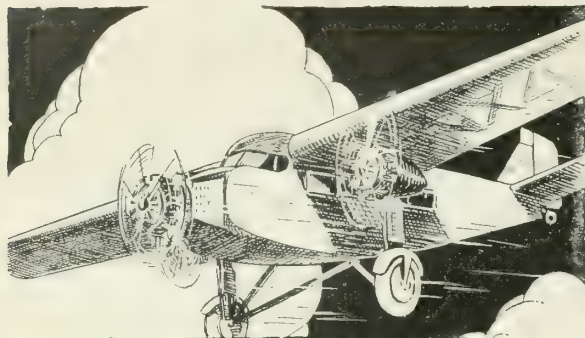
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Hook up your engine to this Master-Reliance Tachometer and the tachometer to be used on the plane by means of a dual Reliance adapter. Test simultaneously—prove actual R. P. M. of your engine and the accuracy of the instrument.

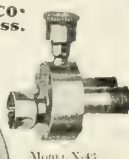
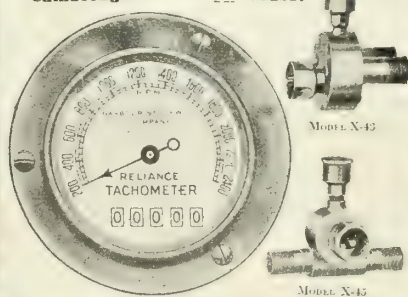
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 D-18-B....200-2400....Internal Gear...1 to 1  
 D-23-A....300-3600....Direct Drive...1 to 1  
 D-23-B....300-3600....Internal Gear... $\frac{1}{2}$  to 1  
 D-21-A....300-3600....Internal Drive...1 to 1

**Back Flange Case for Inserting Mounting**  
 Model R. P. M. Type Drive Ratio  
 D-17-A....200-2400....Internal Gear... $\frac{1}{2}$  to 1  
 D-17-B....200-2400....Internal Gear...1 to 1  
 D-21-A....300-3600....Direct Drive...1 to 1  
 D-21-B....300-3600....Internal Gear... $\frac{1}{2}$  to 1

Instrument Dept.

**BARBOUR STOCKWELL CO.**  
 Cambridge Mass.



# RELIANCE TACHOMETERS

(Continued from preceding page)

city. And Marysville, just south of there, doesn't thrill me, either. I got all my early schooling in the Boy's Reform School there.

I got Aunt Mary half warmed at Cincinnati, and then moved him on through Kentucky, past interesting old Lexington, a spot of romantic interest to me on account of the bonded warehouses.

Any place in the blue grass country is good landing, but any place below there is bad news. And it gets worse and worse as you proceed. Once past the Cumberland River I gave up hope in everything except the good old Wright Whirlwind. And over northern Tennessee I sort of got doubtful even of that. I'd have traded places with anyone in a trimotor, any place. Still, I've worried about so many things that never happened to me that I ought to have sense enough by now to stop fidgeting. But I haven't. Mountains and no place to land except railroad tracks or woods always make me thoughtful. We were all thoughtful—even Aunt Mary forgot that he was cold. But then I found something to interest me, and forgot all about that impossible landing country.

After Wartburg—pretty name, eh?—the country got better, until we flew over the beautiful valley of the Tennessee and passed over the mountains of Polk County, which, by the way, rejoice in the names of Beans Mountain and Big Frog Mountain. Then over half of Georgia to Atlanta, where Doug Davis put the folding waffle-iron carefully away for the night, and where I took Aunt Mary to the hotel and laid him on the radiator to thaw out. He soon regained consciousness, and after the third glass, when I heard him say, "My name is Rowell!" I knew he was melted for the evening.

Next day, while we ambled across Georgia, past Macon and down along the Ocmulgee River country—and beautiful country it is—the weather got warmer and warmer. Old Frigidaire even sat up and looked around, and forgot to stamp his feet, so I knew we were on the trail of that sunshine at last, though the day was hazy. And say! Did it feel good to take off the old winter overcoat and toss it and the felt hat onto the back seat and kick off the arctics? It certainly did. I thought of the boys up north plowing across the Alleghanies against a stiff northwester, or beating along that old Erie Canal route from Albany to Buffalo, and of Rex Huntoon and Gordon Hood simply freezing to death on the Syracuse Airport—and I just laughed right out loud. (Gordon and Rex are just like two ground-hogs. I've landed there six times this winter and never once have they been out of that office until I taxied right up there. Then they stick their noses out, sniff the air, and duck in again.)

We landed at Jacksonville for gas—and I found it was the first airport in the country where my check wasn't good! Tried to pay for gas, and found it was a rule of the City Fathers that no checks were accepted. Cash only, and at once. You see, Florida is the original birthplace of the rebounding, or gutta percha, check; and the City Treasurer had so many of those things that he'd naturally got to shying like a balky horse whenever he saw a piece of paper. So I had to pay cash. Good field and good service at Jacksonville. Good service almost everywhere now—not like the old days.

That run down the Florida east coast is delightful: fine, flat sand beach all the way—you could set a ship down on it anywhere and go in for a swim. And it's great fun to fly along as we did, not more than twenty feet above the

(Continued on next page)





ROY F. MORRIS, President and Manager

## And Here Is Why I Teach You Best

1. We have an airplane manufacturing company in conjunction with our school where the student has a chance to learn about building and construction of airplanes and motors.
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We've built up a wonderful school here because we give every student their full money's worth. We've made these courses just as low as is consistent with the best training—that's why every Morris graduate is a booster.

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(Continued from preceding page)

beach, and wave at the bathing girls. A few years ago Earl Ward was flying the mail from New York to Cleveland, and he discovered about six nymphs bathing in a secluded woodland pool on Ringtown Mountain. Earl flew around for I don't know how long—like a moth around a candle—while the girls danced about on the sands and waved up at him. Fancy that, now! And he never thought to drop that old DH in the pond and claim he had engine failure, or heart failure, or something. I always thought less of Earl's ingenuity after that; but the Post Office Department rewarded him with a medal for bringing the mail through only ten minutes late under very trying conditions. But nothing like that tempted me to hurl the Fairchild into the Florida waters, so we landed at Melbourne—an excellent field that is a credit to such a small city—and after refueling and fooling around a little we continued to Palm Beach.

There I decided that about the only thing that was run on the level was the ocean. Man! Those hotel prices! And the service! I think the hotel management had offered a prize for the slowest bell-hop, and they were all trying hard to win. I'd vote for mine, though. I ordered White Rock and ice twice—and each time the ice was all melted before he got to the room. I had to phone down, "Pack the next lot of ice in asbestos or sawdust." They said they would, but it was no use—he fell asleep on the stairs and never got up to me at all. But nobody hurries in Florida—even the electric fan in my room refused to run. The only lively things I met in Palm Beach were a widow from New York and a sand flea—and the only one I got really intimate with was the sand flea. I flew him part way to Miami, but at Fort Lauderdale he apparently got disgusted with his slow progress, for he got out and jumped on ahead of me. And you should have seen the hurt look he gave me!

Miami's a lovely city, and Miami Beach is the place Ponce de Leon was looking for when he was searching for the fountain of youth. They bring the fountain stuff right in from Bimini in bottles. I played around with Bob and Mrs. Moore, the turtle doves of the aviation business. They're great scouts, those two, and we had a fine time. Bob's flying for Harry Rogers and having the time of his life, as usual.

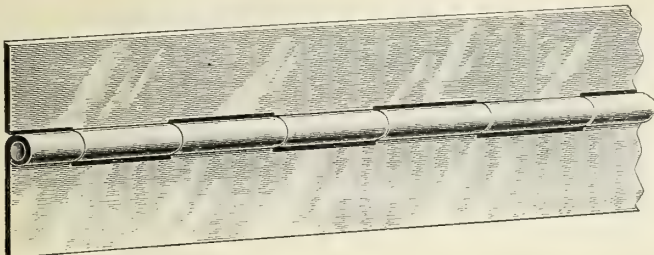
I forgot to say that I had left my two passengers at Melbourne and was attached to an aggregation of fifteen automobiles known as the Goodrich Silver Fleet. These cars are touring the United States and it was my business to add to the publicity of the Fleet by appearing with it in the Fairchild. However, my motto is pleasure first and business afterwards—if you have any time left for it. And I'm hanged if that Fleet didn't sneak off while I was in swimming, or some place. I never did see it there. But I got a great tan, anyhow.

My next stop for refreshments was Tampa, across the state to the west coast. I had a talk with H. S. Jones, general manager of Sky View Lines from Niagara Falls, who was playing Florida for the winter with their trimotored Fords. Jones said that if I strayed away from the railroad running through that swamp country between West Palm Beach and Sebring, 100 miles, and had a forced landing that the only thing left of me would be a memory. And he was right. He advised that I follow the railroad closely to Okeechobee and Sebring, and to phone him when I got to Tampa. If he didn't get a phone that night he would start out next morning in the Ford and look to

(Continued on next page)

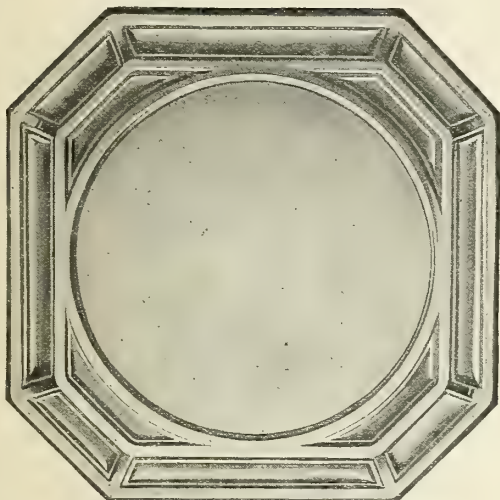
# ALL NECESSARY HARDWARE AND TRIMMING MATERIALS USED IN AIRPLANE CABINS

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No. 4¾ Zaida with plain frosted or star cut glass.

## Silk Hand Rope Pulls or Assist Cords



No. 315. Stock colors: gray, blue, green or taupe.

## Electric Switch



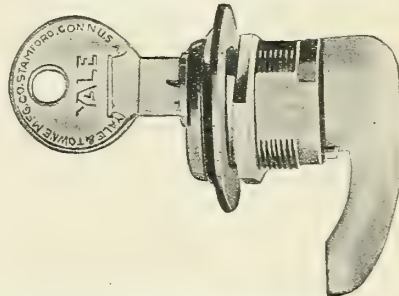
No. 7460: Slide button switch with nickel plate.

## Finishing Washers



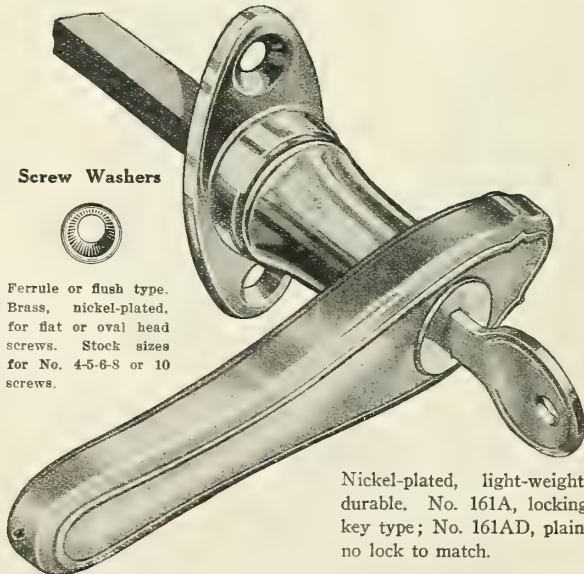
Brass, nickel-plated. Countersunk for oval screws. Stock sizes for No. 4-6-8-10-12-14 or 16 screws.

## Compartment Cylinder Lock



For instrument board, tool pockets and other purposes. No. C 775, nickel-plated.

## Outside Handles for Cabin Doors



## Screw Washers



Ferrule or flush type. Brass, nickel-plated, for flat or oval head screws. Stock sizes for No. 4-5-6-8 or 10 screws.

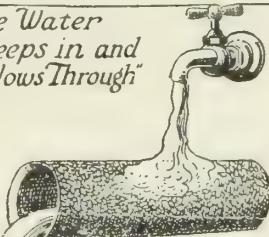
Nickel-plated, light-weight, durable. No. 161A, locking key type; No. 161AD, plain, no lock to match.

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Flows Through"*



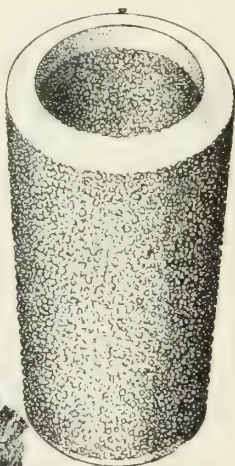
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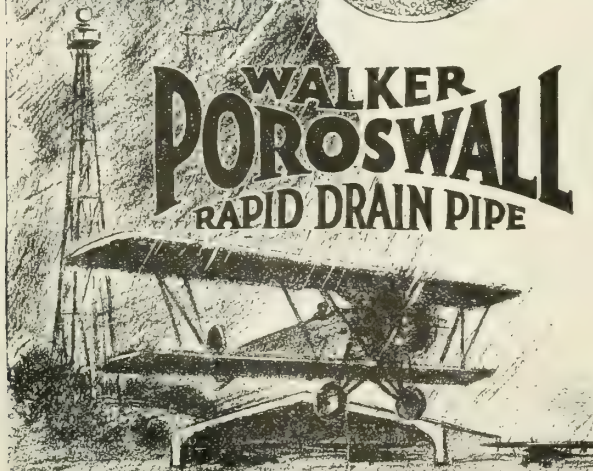
"Poroswall" Rapid Drain Pipe is made of porous concrete; and concrete, of course, means permanence, long life and strength. "Poroswall" far exceeds the demands of the American Society for Testing Materials for strength. As for its drainage-efficiency, the Columbia University Testing Laboratories found that the infiltration capacity of a square foot of its surface averages five gallons of water per minute.

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Walker Cement Products,  
Inc.  
Little Ferry, N. J.



# WALKER POROSWALL RAPID DRAIN PIPE



(Continued from preceding page)

see if the alligators had left anything of me for lunch. That was mighty fine of him, I thought; and while I was actually flying that impossible country I thought it was even finer. Many thanks, Mr. Jones. For that country is just one huge swamp, with not a thing to land on except the railroad and one or two little dry fields near Okeechobee and Sebring. Even the birds, all except those with webbed feet, follow the railroad when flying across the state. I can understand now why George Haldeman didn't mind flying an ocean—it was a rest after the Florida swamps he'd crawled over in Jennys. I flew part way at about thirty feet above the tracks, for it wasn't any safer at a thousand than it was at thirty, and I saw several alligators. Or I supposed they were alligators, though after what I had gone through in Miami I'm not quite sure if they were real or not. But they *looked* real. I distinctly noticed a look of disappointment on the face of one of them as I flew on past him.

Tampa. Honest hotels again, for a change. And a good little air meet at which—I know you won't believe me—I won first prize in a race. I beat two Robins, with E. P. Lott in one of them; and who was in the other I don't know, for he was so disgusted at my beating him that he never came over to speak to me. And not only that, but I flew to St. Petersburg next day and I'm hanged if I didn't beat old E. P. again. I maintained that these victories were due to my superior piloting, but Lott said the fact that I had a Whirlwind while he was anchored behind an OX-5 may have had something to do with the outcome. But I refuse to believe it. These are the first races I've won since 1925, and I refuse to let go of one ounce of credit. E. P., I won because of my superior knowledge of aviation—don't forget, my boy, that I once listened to a lecture by Commander Byrd! Lott and I were all right in that race, but the fellow who deserved to win on his piloting was Eddie Hamilton in the Ford Trimotor. I never saw a big Ford flown that well before. Eddie banked it around the pylons with all the abandon usually displayed by a gent in a Waco. He flew a great race, and the only reason he didn't win was because the big ship couldn't accelerate after the turns. There's nobody in the world who can handle a Ford quite as well as Eddie Hamilton.

We were treated royally at St. Petersburg, for which thanks are due Bob C. Smalley, Perry Hutton, Johnny Green, and a lot more whose names slipped away from me during the splendid entertainment they gave us at the "Gangplank," a restaurant that merits praise. It was just a great time down in that city where the sunshine spends the winter, and I hope to go back there next year. I could spend pages talking about sunshine land, but I'm at the end of my space and will have to make way for the ads with my old pal George Haldeman, who had just got back from his non-stop flight from Windsor to Havana.

### ENDURANCE FLIGHTS

(Continued from page 39)

ship. At about this time, I started the clockwork of the barograph and with considerable difficulty installed the instrument in the tail of the ship, just back of some enormous gas tanks. The installation had to be effected through a small opening not more than 6 inches square located on the top part of the fuselage. After installation, the opening was securely sealed with a piece of fabric and some airplane dope. After filling the tanks to

(Continued on next page)

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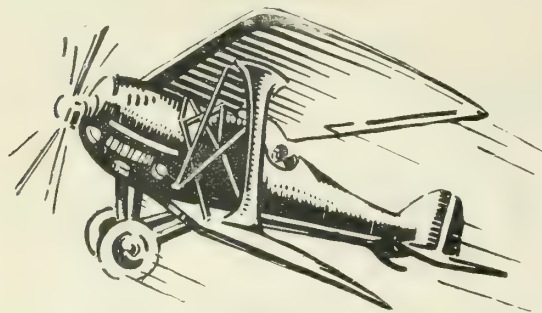
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(Continued from preceding page)

capacity—about 500 gallons—the pilot took off alone. The climb was slow, and after a few miles of flight it became necessary, because of obstacles, to dump his load of gas and return for a new take-off. On landing, the barograph was found to be down in the bottom of the tail, having broken the suspension wires. In spite of the fall, the instrument continued to function satisfactorily. Another barograph was installed, and after snatching some welcome lunch, the pilot decided to take off once more with a somewhat less amount of gas. This time the ship took the air with ease and continued to remain aloft, circling around the fields of Long Island. Lieut. Thomas carried aboard the ship a radio receiving set for use in obtaining the daily weather reports. During the afternoon he was serenaded by the local radio stations, which would now and then halt their broadcast program in order to give him a few words of cheer. Notes were dropped from the plane at intervals telling that all was well. The next day found the pilot still flying. A note was dropped telling that radio reception was now at an end because of the loss of the trailing antenna, which accidentally had been cut off while flying low over a hangar. Another note in the afternoon told of a cracked gasoline gauge. Aside from that, everything was all right. In order to inform Lieut. Thomas of the weather report for the coming evening, Lieut. H. B. Clark of Roosevelt Field painted the weather information on the sides of his plane and then flew up near the endurance plane displaying the "flying billboard." Sunset came, and the lone flier started his second night in the air. He had discarded his now useless radio set in order to lighten the ship. With the dragging on of a few more weary hours, he had equalled Col. Lindbergh's New York-Paris solo duration time of 33 hours and 28 minutes. At this critical time, I went to Mitchel Field and planned to remain there all night if necessary, ready to clock a possible forced landing. A night landing could be made only at Mitchel Field, because at that time it was the only field equipped with floodlights. Jackson Martindell, G. M. Bellanca, and a few others intensely interested in the flight were there. At times, three welcome flashes would appear from aloft, signifying that all was well. Getting on towards midnight there suddenly appeared out of the sky four dreaded flashes. This was the prearranged signal for a forced landing, and sure enough, soon out of the darkness there came the swish of a landing plane, then there was a dull thud as the wheels hit the ground, and with the pressing of the official stop-watch, the flight was over. With considerable difficulty, I then removed the barograph from the plane and stopped the clockwork. A glance through the glass window of the instrument showed that it had functioned perfectly, giving an especially fine trace which recorded every slight variation in altitude during the flight which had terminated after 35 hours, 25 minutes, and 8 seconds. This established a new unofficial record for solo duration flight, exceeding the flight time of Col. Lindbergh from New York to Paris by 1 hour and 57 minutes. As we go to press, Martin Jensen is still flying above Roosevelt Field in an effort to break Thomas' record.

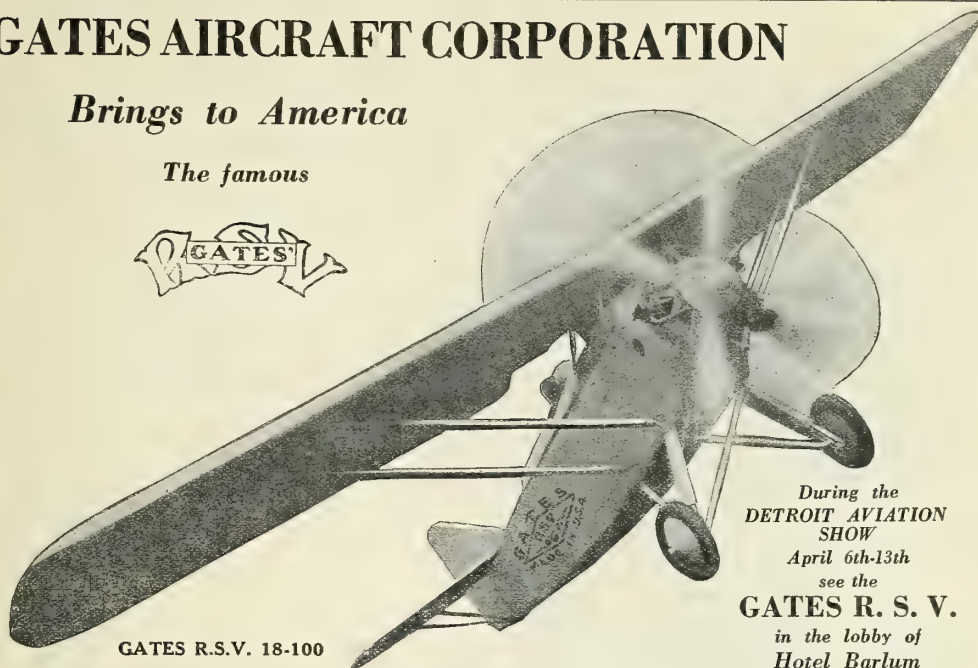
On the afternoon of May 3rd, Lieuts. Gavin and Soucek, U.S.N., Aviation Mechanic J. C. Proley and Mr. H. F. Dayton took off from the waters of the Delaware at Philadelphia in a PN-12 seaplane powered with two Wright Cyclone engines of 525 horsepower each. This was the first of a series of naval duration flights. The ship, a

(Continued on next page)

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creditable product of the Naval Aircraft Factory, cruised over the Delaware in an attempt to extend a former duration mark—that of 28 hours and 35 minutes which was established in May, 1925, by Lieuts. Schildhauer and Kyle in a PN-9 seaplane. Excellent weather prevailed during the flight. Without unusual incident, the PN-12 seaplane finally landed on May 5th, having successfully made a duration time of 36 hours, 1 minute, and 14 seconds which established a new world's record for seaplanes.

On May 25th, Lieuts. Soucek and Maxson, U.S.N., took off from Philadelphia with the Navy PN-12 seaplane, powered this time with two Pratt and Whitney Hornet engines of 525 horsepower each, and carrying now a pay load of 1,000 kilos. This flight, made during unfavorable weather conditions, terminated prematurely because of a severe rainstorm. When the ship landed on May 26th, the gas supply was sufficient for 8 hours of flight or more. In spite of being forced down, the ship with a pay load of 1,000 kilos established an official world's duration record of 17 hours, 55 minutes and 14 seconds. In addition to the above mark, this flight also established new records for speed and range. Increased performance of the PN-12 over previous PN boats has resulted through the new power plant and the structural lightening of the ship. The former PN planes have always utilized water-cooled engines. This plane used the new air-cooled type which already had made a splendid showing in remarkable flights.

On May 31st, Major Carlo del Prete and Capt. Arturo Ferrarin took off at Monterell Field, Rome, in a Marchetti monoplane powered with a Fiat water-cooled motor of 500 horsepower. They flew in a closed circuit, making 51 round trips from Torre Flavia to Anzio. The ship landed on the 2nd of June, establishing for a land plane a new world's official endurance record of 58 hours, 34 minutes and 26 seconds. This trial was in the nature of a preliminary flight to that made one month later (July 3rd and 4th), when these Italian pilots succeeded in a speedy non-stop flight from Rome to Brazil. In this splendid flight, which covered 4,466 miles, another official record was made—that of airline distance. Italy may well be proud of these two men of the air who captured within the short period of one month, two most important official records—those of distance and duration.

On June 6th, Commandant A. Vicherek made a flight at Prague, Czechoslovakia, in a light Avia B.H.-11 B monoplane powered with a Walter 60 horsepower motor. The total weight was 770 pounds, a light plane in the third F.A.I. category. Flying-over a closed course of 100 kilometers twenty-four times, Vicherek landed June 7th and made an unofficial record of 19 hours, 55 minutes, and 38 seconds for a light plane. As yet, no official F.A.I. category has been established for duration in the light plane class. The distance (closed circuit) covered was officially recorded as 1,553 miles.

On June 29th, Jimmy Rinehart made a duration flight at Seaside, Ore., in an American Eagle land plane powered with a Curtiss OX-5 motor. This flight, unofficially recorded, terminated after 16 hours, 34 minutes and 25 seconds.

On July 5th, Johann Risztics and Wilhelm Zimmerman took off from Dessau, Germany, in a Junkers W. 33 monoplane powered with a single Junkers LV water-cooled engine of 280 horsepower. Starting early in the morning, they succeeded in getting off the ground with 785 gallons of gas. The total weight of the plane was estimated at

(Continued on next page)

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Howard Mingos, writing in a recent issue of the *Saturday Evening Post*, says: "These are boom days in aviation. New companies are formed daily. Airplane factories are springing up like mushrooms. A constant stream of capital is flowing into the flying business. Nothing quite like it has ever happened before."

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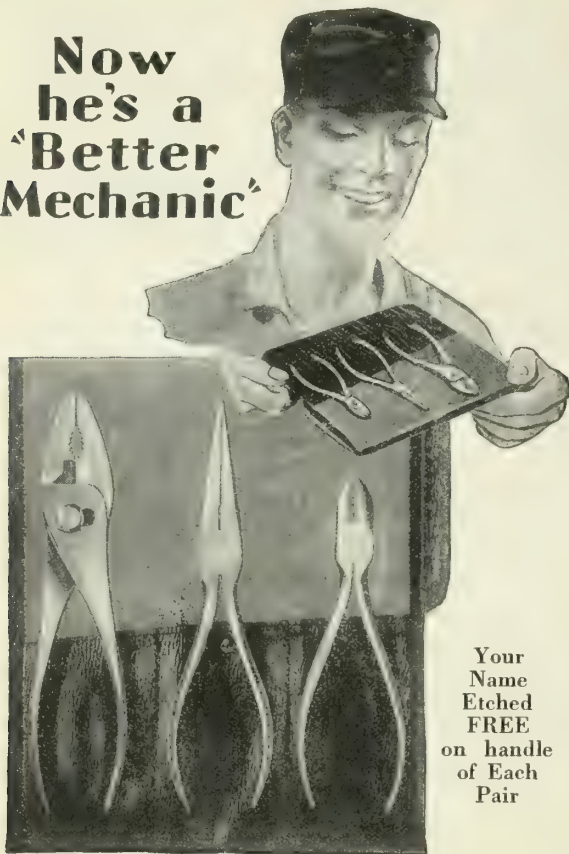
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AND MAIL TODAY!**

(Continued from preceding page)

7,920 pounds. With this capacity load, they started their closed circuit flight of 5,034 miles, flying between Dessau and Leipzig. This remarkable flight finally terminated on July 7th, and established for a land plane a new official world's record of 65 hours and 25 minutes. It bettered by 6 hours and 48 minutes the notable record of 58 hours and 37 minutes made by the Italian fliers, del Prete and Ferrarin. This German duration mark, in spite of the creditable efforts of Brock and Schlee (September 29 to October 1), still remains unbroken.

On the afternoon of July 11th, Lieut. A. W. Gorton, U.S.N., and Chief Boatswain E. E. Reber took off from Philadelphia in a PN-12 seaplane powered with two Pratt and Whitney Hornets. The ship on this flight carried a pay load of 2,000 kilos. This load was in addition to crew, fuel, oil, and provisions. A landing was made on July 12th, after establishing a new official world's record of 16 hours, 39 minutes, and 51 seconds for a seaplane carrying 2,000 kilos. In addition to the duration honors, new records were made for range and speed. In all, five new world records were captured by this single flight. It was indeed a red letter day for the naval patrol planes.

On July 29th, Peter Hasselback started off at Corn Hill on the north end of Cape Cod, Mass., in a Darmstadt glider and landed after soaring for 4 hours and 5 minutes. This motorless flight not only established an official American record, but what was more important, it aroused interest in this new sport which just now is being introduced into this country.

On August 15th, Glyder Kornfeld started off at Vienna in a Darmstadt glider and finally landed 7 hours and 54 minutes later, establishing an unofficial world's duration record for this type of aircraft. These records in gliding flight must be considered unofficial because as yet no F. A. I. category has been established for them.

On August 16th, Capt. Hubert S. Broad took off at North London in a DH Moth land plane powered with a new Gipsy motor of 90 horsepower and established in a light plane an unofficial duration record of 24 hours.

On September 2nd, M. Maurice Finat of France took off in a Caudron C.109 land plane powered with a 40 horsepower Salmson motor and established a duration time of 24 hours and 36 minutes, which was a new unofficial duration record for a light plane.

Soon after daybreak, on September 29th, W. S. Brock and E. F. Schlee at San Diego, Calif., took off in a Bellanca monoplane powered with a Wright Whirlwind engine of 220 horsepower in a notable attempt to break the German duration record then standing at 65 hours and 25 minutes. Starting with 560 gallons of gas, 40 gallons of oil, and abundant provisions, they apparently took the air without great difficulty and headed out over the sea. The take-off over the water had an advantage in that the air conditions are much steadier than over land. Also, when over the sea, it is not necessary to climb suddenly in order to clear obstacles which might be found on land. A sealed Richard barograph was mounted in rubber bands within the fuselage. These supporting rubbers tend to absorb the shocks of take-off and landing, as well as to damp out the vibrations of the plane during the flight. With such a mounting, the barograph pen will describe a fine, clean cut trace on the smoked chart of the instrument, showing every little variation in altitude during the entire flight. In absence of a radio receiver, the fliers obtained their daily weather reports from Ted Lundgren, who painted such information on the sides of his ship and flew along-

(Continued on next page)



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RD-OT

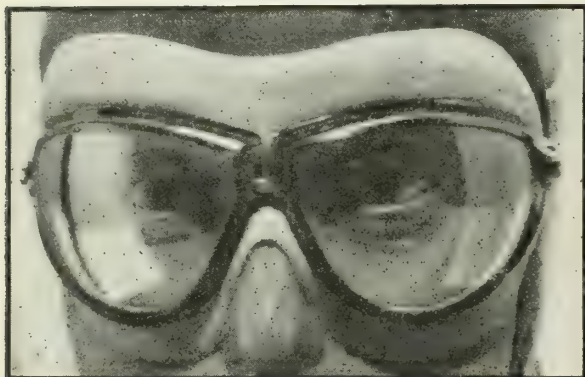
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(Continued from preceding page)

side the endurance plane. The plane continued to soar smoothly over Southern California for three days and two nights, but because of a gas leak that developed during flight, the ship was forced to make a premature out-of-gas landing at Rockwell Field on October 1st. The duration flight had lasted 59 hours and 30 minutes. Unfortunately for the pilots, the flight was about 6 hours short of the standing German record, or seven hours short of a new world's record. Some consolation, however, was found in the fact that this flight established a new American record, formerly held by Haldeman and Stinson in a Stinson-Detroiter.

On December 20th, Miss Viola Gentry, first of the women duration fliers, took off with 100 gallons of gas from Roosevelt Field, Long Island, New York, in a Travel Air biplane powered with a Siemens-Halske radial air-cooled motor of 125 horsepower. The flight lasted 8 hours, 6 minutes and 37 seconds, which was an unofficial record for women duration fliers. It may be of interest to note here that as yet no official F. A. I. categories have been established for women's records or for duration records in the light plane classes. The initiative of Miss Viola Gentry, nevertheless, has stimulated the idea of endurance flights in the minds of other women, as shown, for example, by the successful efforts of Miss Evelyn (Bobby) Trout of California and Miss Elinor Smith of New York, whose endurance flights took place during the first of the year 1929. The indications are the contest rivalry among women fliers during the coming year will be most keen. The women's duration record (22 hours and 3 minutes) is at present held by Louise McPhetridge Thaden.

As a fitting climax, it may be well to mention the greatest of all endurance flights—that of the trimotored Fokker monoplane, *Question Mark*. Starting early in the morning of the first day of the new year (1929), this Army land plane with five men aboard took off at the Los Angeles Metropolitan Airport, for a refueling endurance flight. Due to excessive wear on the valve stems at the points of contact with the rocker arms, one of the motors failed to function and the ship was finally forced down at the Los Angeles Metropolitan Airport on January 7th, after remaining in the air for 150 hours, 40 minutes and 14 seconds. This official duration record was the greatest ever recorded for any type of aircraft in the history of aviation. It has just been recognized by the Federation Aeronautique Internationale as an official world's record for refueling in flight and returning to point of departure.

(Publication approved by the Director of the Bureau of Standards of the U. S. Department of Commerce.)

### COMMERCIAL AIRCRAFT ENGINES

(Continued from page 102)

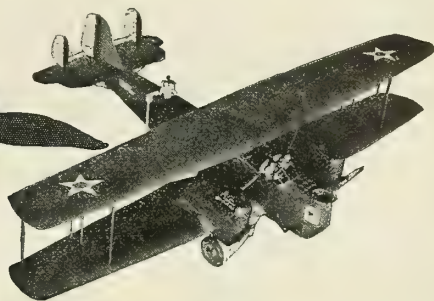
the log of a 25-hour preliminary run of at least one-half rated power. The test proper consists of (1) a 50-hour endurance test, (2) a power curve test, and (3) a flight test. However, the flight test is being waived in the case of engines which have a record of successful performance in the air.

(1) The requirements in detail are as follows: The 50-hour endurance test shall be run in ten five-hour periods. During the first five hours the engine shall be run with the throttle wide open, the speed being at least equal to the rated speed specified by the manufacturer. A provisional

(Continued on next page)



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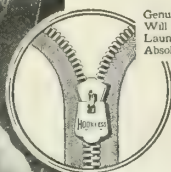
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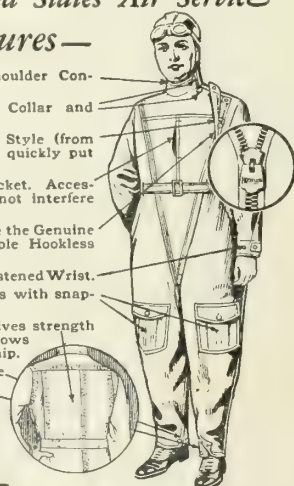
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power rating of the engine will be based on the average horsepower developed during the first period. During the remaining nine periods, the engine shall be run at approximately 97 per cent of rated speed and the horsepower developed should at no time be less than nine-tenths of the rated horsepower. The provisional power rating shall remain in force for one year or until design changes or further tests justify a change.

During the test, not more than three forced stops shall be allowed. A penalty run of two hours will be added to any period in which a forced stop is made. If the speed during a propeller-load run drops to less than 95 per cent of rated speed or the power in a dynamometer run drops as much as 10 per cent, this shall require a forced stop. The failure of a major part of the engine shall terminate the test.

On completion of the 50-hour endurance test, the necessary runs will be made to obtain a curve of power against speed by varying the load with the throttle wide open. Readings should be made at speeds ranging from 75 per cent of normal speed to approximately 110 per cent of normal design and construction. Although this information has no very direct bearing on the safety of the power plant, it does determine the suitability of the engine for use in a given type of plane and for a given kind of service. It is, therefore, essential to the selection of a safe combination of engine and plane.

(2) The tests afford information as to structural safety and reliability. By running an engine for long periods at loads and speeds equal to or greater than those expected in practice, serious inherent mechanical weaknesses will probably develop into failures or show up on subsequent inspection in excessive wear, local heating, incipient cracks or loosening of threaded parts. On the other hand, such tests alone give little information as to the margin of safety of the structural design. Parts may be stressed too near their elastic limit, and might fail from repeated stresses if run for longer periods or at speeds somewhat greater than in the tests. The structural materials used may not be sufficiently uniform in composition or in heat treatment, so that occasional failures may occur in service, although the individual engines tested did not happen to contain any faulty parts and successfully completed the tests.

(3) These tests serve to point out faults in design which would lead to unreliable operation or failure after long use. For instance, a design may have obvious mechanical weaknesses such as points where stresses are concentrated, or parts in which the material is not well distributed for maximum strength. There may be parts liable to displacement or which may become loose, or parts too difficult to service properly. Some such faults are indicated by failure or incipient speed. Each speed should be maintained for at least five minutes before a reading is taken. After the block tests, a complete tear down and detailed inspection of engine parts shall be made, particular attention being paid to excessive wear or signs of failure.

No approved engine installed in a licensed airplane shall be equipped with a propeller so designed or adjusted that at full throttle the engine speed will exceed by more than 3 per cent, the official rated speed of the engine in level flight at approximately sea level altitude.

A total number of 10 engine types have been tested in 14 official type tests (Dec. 1, 1928). Four of these types have had a second test after the correction of faults which

(Continued on next page)



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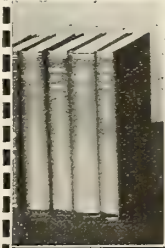
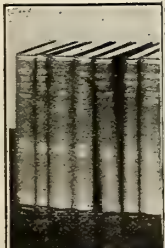
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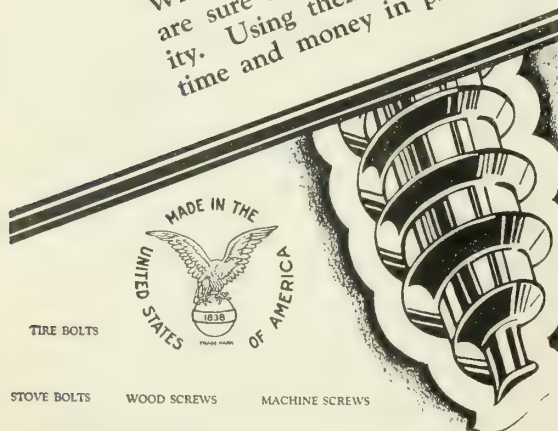
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(Continued from preceding page)

had led to rejection of the type on the initial test or which had been discovered during the first test.

Of these 10 types, three have successfully met the requirements of the Department and have received airworthiness certificates. Others of those which have failed to pass the tests will doubtless pass a second test within the next few months. Two engines received airworthiness certificates before the present regulations were in force, and several certificates have been granted on Army or Navy acceptance as explained in the test requirements.

It should be noted that the tests to which these engines have been subjected serve the following purposes:

They determine the operating characteristics of the engine, such as power-speed range, fuel and oil consumption, consistency of operation, cooling requirements, etc. Barring gross mechanical faults, the figures obtained should apply to any individual engine of the same failures; others are noted on inspection by the members of a skillful and experienced test crew, even though no failure has occurred. Most of such faults have been eliminated from the engines which have been long in production, and they will be relatively rare in new designs drawn up by engineers of long experience in the aircraft engine field.

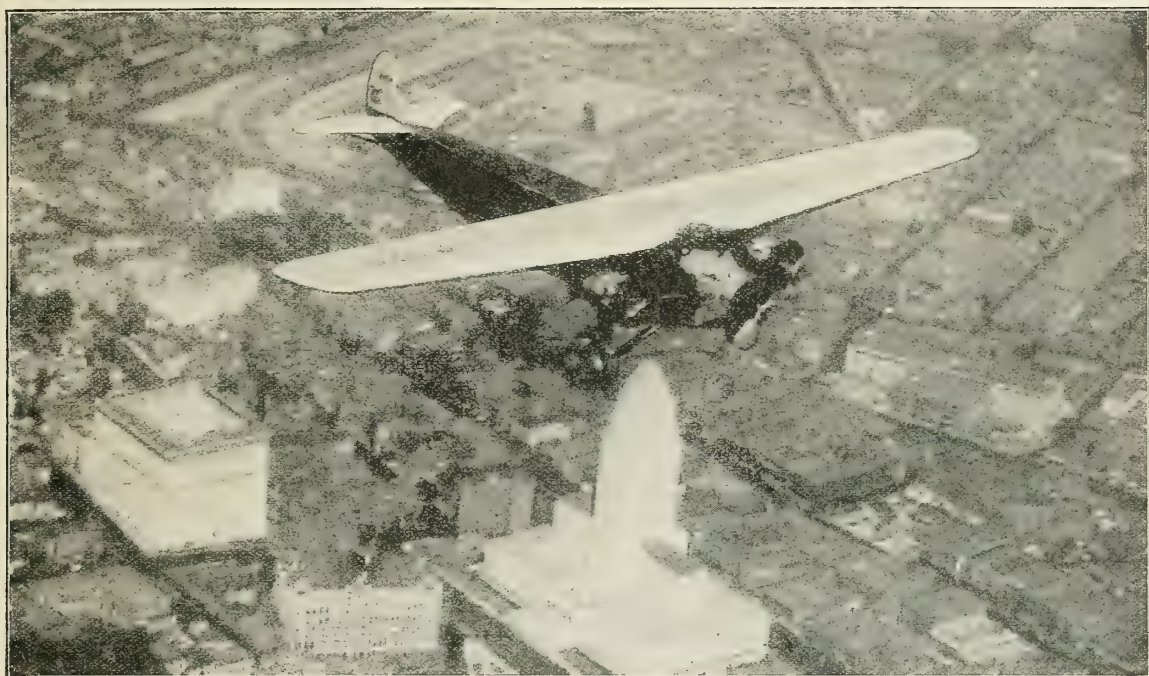
The results of the tests referred to above lead to some rather startling conclusions, which are even more striking in view of the fact that these tests, since they involve the engine only, do not throw light on the important sources of failure which concern the various connections between the engine and the fuselage, such as fuel, oil, and electrical connections or mechanical supports.

An examination of eleven unsuccessful tests shows that only one engine completed half the 50-hour endurance test and five failed in the first test period. The longest test was seven periods and the shortest, 30 minutes. One major failure was due to inadequate provision for cylinder cooling, complicated by insufficient bearing lubrication. The primary cause of one failure was bad piston design, but this case was complicated by insufficient bearing lubrication and inadequate clearances. Two major failures were caused by fatigue failure of a badly designed crankshaft, one was due to master-rod failure, and another to throwing a cylinder. Poor valve stem design caused an intake valve to drop into the cylinder and wreck one engine. A similar failure was narrowly escaped in the case of two other engines. The failure of another engine was due to unreliable ignition. In addition to the failure which terminated the test, these engines had 13 forced stops. Nine of these were rocker arm difficulties, one was a carburetor failure, one was an exhaust valve failure, and two were due to valve springs breaking or coming loose. Since the test is run in five-hour periods and minor repairs and replacements are permitted between periods, the total number of mechanical failures greatly exceeds the number recorded as causing forced stops. It should also be noted that this discussion takes no account of difficulties which developed during preliminary tests at the Bureau of Standards and were corrected.

These eleven unsuccessful engines, if used in flight under the same conditions of speed and power, would have caused on the average one forced landing every four hours, and about half of these landings would have been with the engine wrecked and inoperative.

To be sure, engines are not or should not be operated at full load in the air except for short periods, hence the actual records of these engines probably would not have been so disastrous as indicated above.

(Continued on next page)



## The Fokker Reputation

ASK the world's largest airline operators why they buy Fokkers, and they will sum up with the reply, "We choose Fokkers because of their performance."

What stands behind this statement? To be so powerful, a reputation must be founded on many years of safe and successful operation. To build such faith, aircraft must serve steadily and economically over a long period of time. To satisfy so many owners, under such a great variety of financial, climatic and operating conditions, an airplane builder must deliver the refinements of design and construction which can result only from the widest experience in every phase of military and commercial performance. *That is reputation!*

One of the most extensive airline systems in North Amer-

ica started with a few single-engined Fokkers, later added several planes of other builders, and, based on this positive experience, now use a large fleet of Fokkers exclusively. The biggest operator on the West Coast inaugurated its passenger lines with Fokkers of a type never before built, ordering a fleet of these giant Trimotors *on the Fokker reputation alone*. In another case, a great international transportation system\* adopted Fokkers at the outset, and following a signal success, is rapidly increasing its fleet with F-10 Trimotor airliners.

The great majority of Fokker owners—whether flying the transport or the touring types—sooner or later indorse the Fokker reputation with their repeat orders.

\*Names of these and many other owners, on request.

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Address inquiries to

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OF AMERICA  
66 BROAD STREET  
NEW YORK

*(Continued from preceding page)*

It is certain, however, that had they been permitted to go into general use in any considerable numbers without correction of the faults which caused their rejection, many wrecks and probably fatalities would have resulted. The public and the aeronautic industry have, therefore, been effectively protected by the regulations which require these tests, and temporary rejections.

On the other hand, it appears from the records of the individual failures that nearly all of them are due to faults of a mechanical nature which are not difficult to correct, when once recognized. These engines will, doubtless, be resubmitted after correction of the faults discovered in the tests, and most of them will probably receive well merited certificates. The makers, therefore, in most cases also have been protected from much trouble and expense by the discovery of inherent faults of design before their engines had received the disapproval of the public, which would have followed their sale in the original form.

Correction of these faults, however, could have been done much more quickly and at less cost to all concerned if the engines had all been subjected to more thorough and drastic tests by the makers before submitting them for Government approval.

*(Paper submitted to the International Civil Aeronautics Conference, Washington, D. C., December 12-14, 1928)*

## COMPETING WITH SUNSHINE

*(Continued from page 47)*

took a high swoop and dived forward, missing the tail of the plane by a few inches. The heavy jerk broke the cable, and the glider and its cargo dived to earth, landing in some trees without exploding. With a sigh of relief they landed on Britton Field, with the aid of some red flares which had been obtained from officials of the New York Central Railroad, since the field was not equipped for night flying.

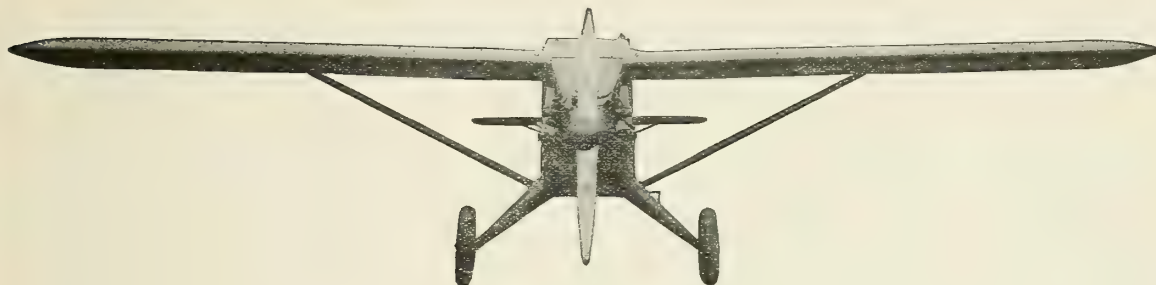
After obtaining the first successful results at Rochester, Lieutenant Goddard went to work on another invention. He had a new idea on speed photography, a device for developing films in an airplane immediately after exposure and dropping them to earth in metal tubes for quick printing and transmission by wireless telephoto apparatus.

At Fort Leavenworth, Kansas, the scheme was tried out for the first time on a large scale. One of the photographs accompanying this article shows results. The picture of the Fort Leavenworth prison was taken from a low-flying plane at 9:48 p. m. In eight minutes the negative was developed in the plane laboratory and dropped to a portable photo sending station loaned to the Army by the Bell Telephone Company. The picture of Fort Leavenworth was transmitted simultaneously to New York, Chicago, and to San Francisco, reaching Chicago at 10:18, New York at 10:23, and San Francisco at 10:30. The commanding generals of the corps areas in these districts were viewing the transmitted photographs within a little over a half hour of the time the shutter had snapped at Fort Leavenworth. Immediately the significance of such speed work, especially in conjunction with night photography, caught the imagination of the public as well as of Army authorities.

Lieutenant Goddard went back to Dayton again and set to work perfecting the various innovations which had made possible night air photography and speed development and transmission. The amount of powder necessary to make night pictures was reduced, and the whole apparatus was rendered foolproof and automatic, so that a pilot with no

*(Continued on next page)*

## Safer and Better Performing Airplanes



*Front View of Aristocrat Cabin Monoplane  
Illustrating the Trim Basic Design of All GAC Airplanes*

A YEAR ago when the personnel of the General Airplanes Corporation was announced aeronautical circles began to look forward to better airplanes, because the engineers and manufacturing executives of this organization, with an average experience of more than twelve years in America and Europe, were recognized as leaders of advanced design.

Today GAC airplanes, after months of hard usage, have fully justified that expectation.

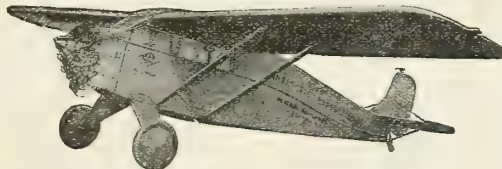
The Aristocrat Three-Place Cabin

Monoplane is recognized in the industry as having established new high standards of safety and performance.

World-famous pilots are enthusiastic in their praise. They talk about its ease of handling, quick take-off and easy landing.

It is as comfortable for winter flying as a closed automobile.

Cost of operation and maintenance are surprisingly low.



*Aristocrat now being used by Commander Richard E. Byrd in his Antarctic Explorations.*

Strictly a quality product, the Aristocrat is the ideal airplane for the business executive, the well-to-do young man and others who demand the best. It

also enables air-taxi operators to furnish safe, comfortable, low-cost air transportation.

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General Airplanes Corporation manufactures a complete line of commercial airplanes of advanced design, all conforming to the specifications of the U. S. Army, Navy and Department of Commerce, as well as the I. C. A. N.



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Wire or Write for our Attractive Offer.*



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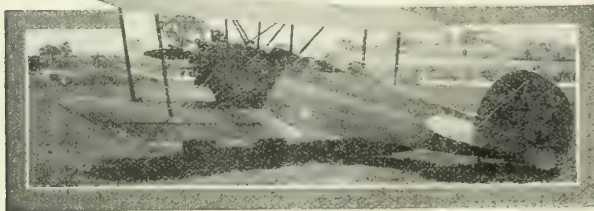


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Passengers everywhere are showing a marked preference for the flying fields where Challenger planes are available—and there's going to be a lot of good business this year at the fields.

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## AIRPLANES MOTORS SUPPLIES

Two HS2L flying boats used two seasons, completely recovered, all in excellent condition, located in Pacific Northwest, quoted, less Liberty motor, each \$2,000. New Liberty motor, \$1,175. Moderately used, excellent condition Liberty motor, \$675. New American Eagle airplane, equipped with Edo pontoons, carrying pilot and two passengers, \$4,350.

Fireworks: flash bombs, \$4; flag shells, \$3.75; illuminated night plane display lasting 14 min., \$36. Gosport two-way speaking tubes with O. D. helmets, \$10; one-way speaking tubes, \$5.50. 5 gals. Nitrate dope, \$7.50; 25 gals., \$1.30 per gal.; 50 gal. barrel, \$62. 26 x 4 tires, unused, \$6.50; slightly used, \$4.50; moderately used, \$3. New tubes, \$2. 750 x 125 unused tires, \$10 each or unused, passable tires, \$7.50; new tubes, \$3; surplus unused tubes, \$1.75. 26 x 4 wheels, \$10. 750 x 125 wheels, surplus unused, first class, \$10; or new production, \$15. 20 x 4 wheels, \$5; surplus tires, \$8.50; surplus tubes, \$1.25; or new production, \$2.

Books: Modern Aircraft, \$5; Dyke's Aircraft Engine Instructor, \$5; Air Navigation and Meteorology, by Capt. Duncan, \$3.50; Air Navigation and Meteorology, by Yancey, \$2.50; Airplane Speaks (excellent for beginners), \$3.50; Aerobatics (excellent for those specializing in stunt work), \$3.50; A B C of Flight, \$1.50.

Set of three Navigation lights, \$6.50. Landing gear struts for JN4D, each, front, \$2; rear, \$2.50; or set of two front and two rear, \$8. Everything for aircraft.

All parts for OX5, OXX6, and many Liberty, Hispano, Fiat, Clerget, LeRhône and Lawrance parts; also parts for JN4D, Canuck and J-1 Standard.

**FLOYD J. LOGAN AVIATION CO.**

**716 W. Superior**

**Cleveland, Ohio**

(Continued from preceding page)

knowledge of photography could do the work alone.

This later period of experimentation resulted in more precarious experiences with high explosives in the air. One night, after Lieutenant Goddard had already been ordered on foreign service, they were hurrying for a last photographic test in Dayton. Five men went up in a Douglas transport plane, carrying six flash bombs and equipped to take six photographs.

In the plane besides Goddard were Lieutenant J. M. McDonnell, from the office of the Chief of Air Corps; Captain Albert W. Stevens, one of the best-known aerial photographers in America, who was later sent to Dayton to take over Lieutenant Goddard's work; Lieutenant Gene Batten, acting as pilot, and William E. Oswald, civilian mechanic.

Captain Stevens was watching the camera and Goddard was in charge of releasing the bombs. They let go the first one on the outskirts of Dayton, over Wilbur Wright Field.

The five experimenters never did determine just exactly what went wrong with the bomb. The nearest they could come to it was a guess that some mechanic had been careless in adjusting the time fuse. In any case, the bomb went off about 15 feet below the tail of the plane.

The shock stunned all of them. The ship tipped far up on one wing, nosed toward the earth, and then back up again.

"When I came to," said Goddard, "I noticed the floor of the fuselage in back of our compartment was all torn away. Closer examination revealed the lower left longeron and all cross members were twisted or broken. All the wooden construction, even in the nose and wings, was badly shattered. Large areas of fabric on the under part of the plane were torn off, and the tail assembly was twisted out of shape.

"The pilot, Lieutenant Batten, was in the nose of the ship, and fortunately was least stunned of all of us. The plane was out of control for a moment, but by jamming his knees against the stick and using all the strength in his arms and shoulders, he was able to get back to something approaching an even keel.

"Nobody knows just how he did it, but he managed a long glide back to Wright Field, flopping down in the center of the airdrome. He saved all our lives. It was one of the best demonstrations of emergency flying I ever saw."

All that saved them from disaster was the fact that the plane in which they went up had recently been equipped, as an experiment, with steel ribs in the tail. These were twisted and bent with the force of the explosion, but they held together.

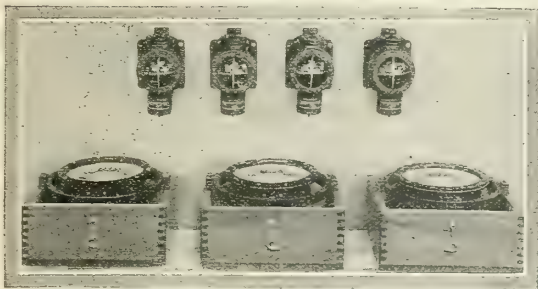
The results of these experiments attracted favorable attention in high Army circles. Assistant Secretary of War F. Trubee Davison followed the process through with intense interest. Such cases as Lieutenant Goddard's, of inventive and technical work of high value performed by experts in the service of the Government, have done much to convince Congress of the necessity for adequate recognition.

Representative Barbour of California said in the House one day, in the course of debate: "There have been officers in the Air Corps who have made the most remarkable contributions to aerial science. I call to mind now the invention of First Lieutenant George Goddard in the field of night photography, a most remarkable invention. Yet Lieutenant Goddard is still a first lieutenant enthusiastic about his work, and in my opinion, there should be some way of recognizing work of that kind."

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Ovington, Beachey, Prince, were the proud possessors  
of the first Star aircraft compasses.

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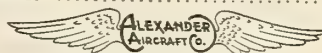
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Gentlemen:

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Room 403, Alexander Industries, Inc.,  
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## GLIDING IS REVIVED IN AMERICA

(Continued from page 45)

the point where they left. That type of glider has a closed-in fuselage.

The third ship is built with a very high aspect ratio, has low parasitic resistance and is made for the purpose of getting up in the air and staying there. Only a skilled pilot can handle it, and beginners should not be allowed to get into those ships.

Mr. Scripps believes that students should be thoroughly versed in the primary ships before going to the higher types, and for this reason he is enthusiastic for the establishment of schools with competent instructors and equipment. Scripps believes that, with safe training ships, good schools and thorough instruction, American gliding and soaring will progress to such a point in the summer of 1930 that it will be possible to conduct national and international contests in motorless flight in the United States.

## AUSTRALIAN AVIATION

(Continued from page 44)

Brinsmead and Capt. Hughes as official representatives.

Among the many matters of supreme interest to Australian-American aviation relations arising at the Washington conference, the movement initiated to rewrite the convention of 1919 is easily the most important. If, as now seems likely, a new international code for standards governing airplane manufacture and certificates of airworthiness is established, with the United States a signatory, there is every indication that Australia, which last year was a considerable importer of American equipment, will look to the United States for increasing experimental and material direction in aviation.

Lieut. Col. Brinsmead, who spent some time in the study of American aviation was asked to indicate the opportunities in Australia for American aeronautical entrepreneurs. He gave AERO DIGEST the following statement:

"With the exception of the United States of America, there is no other country where the principal capital cities, with population varying from a million downwards, are ideally distanced at present limits of commercial non-stop flights. Indifferent roads and our railways with frequent break of gauge, involving vexatious changes at inopportune hours, are an invitation to travel by air.

"People have now become air-minded as a result of the successful operation of routes already organized and the many brilliant flights culminating in that of Captain Kingsford-Smith, Lieut. Ulm and their American companions. In the near future, several thousand miles of air routes virtually encircling the Australian continent, approximately the same size as the United States, will be prepared for aviation and operated to schedule, with long stages lighted by beacons for night flying.

"The activities of the Australian Aero Club are greatly enhancing aviation in popular estimation, an instance being the Sydney Club, whose 900 members are flying upwards of 5,000 hours annually. Many more clubs are formed or are being formed.

"Some thousands of ranchers on large holdings, in a magnificent flying country, from 60 to 150 miles to the nearest town, provide an unrivalled potential market for the sale of aircraft, only awaiting a moderately cheap and tolerably foolproof airplane.

"Recent developments in aircraft production methods in the United States should profoundly affect the future of

(Continued on next page)

## Why B. G. Mica Aviation Plugs Are A Good Investment.



**Safety**

They are good for hundreds of trouble-free hours of service . . . do not break . . . are easily cleaned and adjusted.

They do not limit an engine to less than its full power.

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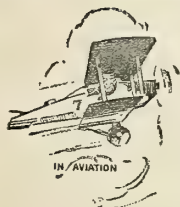
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## Shear Cutter

Cuts heavy flat stock and wire rope with remarkable ease—work that heretofore has required a power or bench tool. Porter's Shear Cutter is as portable as a Bolt Clipper—can be used anywhere and everywhere—in any position. A two-hand tool powerful, easy to handle and invaluable when flat bars, strips or cable are to be cut—in the shop, hangar, mill or construction, etc.

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**ASHLAND STREET, EVERETT, MASS.**



the blades of a pair of great shears, making a clean complete cut. Capacities on flat stock include  $1\frac{1}{2}'' \times \frac{3}{16}''$ , and on stranded wire rope up to  $\frac{3}{8}''$ .

Developed to meet the requirements of the aeronautical department of a large government for salvage and emergency work, this tool has found an immediate place in strip mills, wire rope plants, elevator manufacturing, etc., filling a requirement heretofore not met by any portable hand-operated tool. The jaws pass each other like



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WORK

## Governing principles, construction and capabilities of the modern airplane

A sound, clear and simple discussion of the fundamental principles, construction and capabilities of the airplane and its engine. Written for all interested in the function of airplanes in modern life, the book strikes a mean between the technical and popular exposition, founding all explanations only on the basic principles of physics involved.

### THE AIRPLANE and ITS ENGINE

By C. H. CHATFIELD  
and C. F. TAYLOR

Associate Professors in the Course in Aeronautical Engineering at the Massachusetts Institute of Technology.

329 pages,  $5\frac{1}{2}'' \times 8''$ , 209 illustrations  
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Thoroughly scientific treatment in non-technical language is given to all phases of airplanes and their engines. Emphasis throughout the book is on fundamental principles. Nothing has been described or illustrated which does not contribute to an understanding of these basic facts. Topics such as these are covered:

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- the reason for wing shapes.
- Monoplane and biplane arrangements.
- Resistance of air to bodies in motion and airplane shapes designed to reduce this resistance.
- Stability and airplane control.
- The engine as an air pump and its complete mechanism.
- the power plant.
- construction of the modern airplane.
- types of airplane.

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- V.—Stability and Control. VI.—The Airplane Engine. VII.—The Airplane Engine (continued). VIII.—The Propeller. IX.—The Complete Power Plant. X.—Airplane Performance. XI.—Airplane Maneuvers. XII.—Airplane Construction. XIII.—The Seaplane and the Amphibian. XIV.—The Commercial Airplane. XV.—Military Airplanes. XVI.—Special Types of Airplanes. XVII.—Air-craft Instruments and Accessories.

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A BLEMISH may be taken out of a diamond by careful polishing . . . the scratch or nick on a priceless heirloom can be painted over . . . a beautiful shoe may be paper instead of leather—but, if any one of the infinitesimal, hidden, seldom-discussed parts of an airplane has the least imperfection, an unsolved crash may readily ensue.

• • •

An airplane can never be better than its component parts . . . the metal that covers its structure—its struts—tie rods—turnbuckles—nuts—bolts—cables—shackles . . . the unknown factors which by the breadth of a hair often determine success or failure—life or death.

• • •

If for no other reason, that is why we, who make the innumerable small parts which comprise an airplane, have at all times concentrated and consecrated our every effort in the perfection of our products. That is why our standard of measure has and shall ever be . . . *make it safe for the fliers—the world over.*

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While at the Detroit Show, be sure to visit our booth. Meet the men who *make it safe for the fliers—the world over.* You will find in attendance, ready to welcome you—Mr. George I. Stich, Mr. S. J. Irvine, Mr. L. T. McElroy, and Mr. William G. Kiefaber.



(Continued from preceding page)

aviation in Australia, where already indications are that local motor car history is likely to be repeated in the aircraft sphere.

"The International Civil Aeronautics Conference at Washington offered unrivalled opportunity not only to acquaint ourselves with what America has to offer, but also to impart information of our specific requirements.

"The increasing interest taken by leading manufacturers in Australian potentialities is distinctly encouraging and leads one to hope that an era of efficiency, combined with economy in aircraft operation, may be anticipated in the near future."

### A MILLION MILES OF OPERATION

(Continued from page 37)

Twin Cities and Chicago make this trip a safe one.

Hamilton all-metal planes used on the Air Mail line carry eight passengers, mail and baggage. The same high standard of service is furnished on this line. The feeder line from Green Bay to Milwaukee uses Stinson-Detroiters.

A technical board, composed of a representative of each associated railway and the Airways operating manager, supervises the Air-Rail Service.

Northwest Airways not only chose its equipment after careful study and comparison but has an organization of "hand picked" men. Colonel L. H. Brittin is vice president and general manager; Charles W. "Speed" Holman is operations manager. Pilots and mechanics are chosen only after a thorough study has been made of their experience and ability. Every pilot employed has had more than 5,000 hours in the air. The principle of Safety First is strictly adhered to throughout the entire organization.

Very often the question is asked "Will passenger rates decrease as business increases?" In general the answer is "yes." Northwest Airways gives a concrete example of rate reduction. When the Air-Rail Service was inaugurated last September, the fare between Chicago and Twin Cities was \$45. Beginning April first, due to efficiencies effected in the way of operations, this fare drops to \$30 one way or \$50 round trip. The fare includes transportation to and from airports at both terminals. Railway fare over the same distance plus berth and tips runs to about \$21 and the railway takes 12 hours as against the 3 hours running time of the airline.

Tickets are on sale at the offices of all of the five associated railways with the exception of the New York Central lines, at which offices, however, reservations are accepted.

The board of directors of the Northwest Airways includes Harold H. Emmons, Wm. B. Stout, W. B. Mayo, Jule M. Hannaford, Jr., Col. L. H. Brittin, Eugene W. Lewis, E. S. Evans, Col. Paul Henderson, Frank W. Blair, C. E. Johnson, R. C. Lilly and Earle H. Reynolds.

### RAILROADING THE AIRLINES

(Continued from page 41)

Pan American plans to approach him on a three-hour port-to-port, as against steamer times, but with the additional inducement of a multi-trip yearly commutation ticket as soon as such a basis can be worked out. This status as a repeating customer demands such a concession from air transport companies wherever they operate. He is a commuter and his needs must be met.

(Continued on next page)

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Army and Navy and many  
airplane manufacturers***STANDARD AUTOMATIC PRODUCTS CO.**

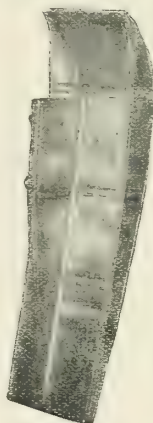
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Write for 1929 Catalog

Dept. H

Rock Island, Ill.

(Continued from preceding page)

He offers another problem, wherever he exists: The problem of baggage. As a rule he travels light, but a part of his baggage must necessarily be appurtenances of his business—a brief case as a minimum generally. Some sliding scale should be made for him in this respect. At present, passengers are carried for a uniform price regardless of weight, and their baggage up to thirty pounds is carried on the same ticket. More than thirty pounds is carried at excess rates. For the business man travelling on a multi-trip ticket it will be found feasible and profitable to honor a gross weight on such a ticket regardless of how much of that weight is baggage. From the traveller's standpoint, he is obviously losing and the company gaining if he, tipping the scale at 145, grosses only 175 with baggage whereas the man across the aisle weighs 190 to start with and grosses 220. Naturally the lighter man feels that, although he has paid the same price, he has had to leave his extra shirts and collars behind just because his companion hasn't taken enough setting up exercises to keep his paunch down.

Average weights can be worked out from line records and insurance tables to enable companies to weigh in each purchaser of a commercial commutation ticket and allow his excess baggage rebates on every pound that he shows below the average.

These commercial travellers are all-year round business, and their problems present themselves for consideration. On the West Indies run, they are highly important, and the fact is recognized in the organization of the Miami-Central America-Panama passenger flying which a few months will see in operation.

These passengers should be studied on every route operated in the States, and home offices of the enterprises they represent should be approached by transport lines with the expense-account-saving-as-a-result-of-time-saving argument.

Another practice, which steamship companies in particular have employed for years, to cut overhead on plants made inactive through the slack travel season, is the club-rate tour which sells primarily a destination and the novelty thereof. Pan American will inaugurate the first extensive aerial tour of the Indies this summer.

Heretofore airlines in the main have been content to limit this tour business to a flight over an especially scenic spot and return, with or without a few hours on the ground—or to fly these tour trips on a charter basis alone. In other words, if a man wants to get up a party to go somewhere he has thought of, he can get a plane to go in. If he doesn't think up a place, the plane simply stays in the hangar until he does.

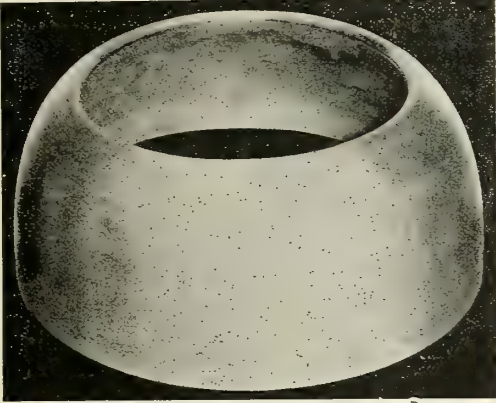
The West Indies Tours this summer will be extensive affairs, approaching the scope of the steamship tours and attracting the passengers on a club-price, places-of-interest and days-to-be-spent proposition.

It is a legitimate business and one of the steps in the ultimate development of aerial transportation on a railroad-like footing. It keeps planes off the ground, and therein lies return on capital invested.

The round-trip, all transportation-expense excursion is another item that airlines must get after. A trip to the Capital on Washington's birthday and made-to-order side trips along regular routes.

In Haiti, for instance, one of the most interesting sights is the Citadelle of the Emperor Christophe—off the beaten tourist track and seen only by one out of every fifty travellers who visit the Republic—inaccessible to inactive people

(Continued on next page)



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(Continued from preceding page)

and a rather tedious trip at best when taken overland. By air, on the other hand, readily reached and seen, in fair weather. The regular Pan American route passes over a hundred miles to the southward. How profitable a side trip would be in this case.

We have only begun to explore the possibilities of aerial transportation, but we mustn't lose sight of the fact that they are infinite. A few years will see great aerial combines engaged in active warfare on the price-facility battlefield that the railroads have fought over for half a century, with this great difference—that every airplane can travel the exact route any other airplane can travel without using the other's property, for the air is free to everyone, whereas a line of steel rails is private property. Freight wars and passenger wars—speed wars and comfort wars—we will

see, and when the fight that is threatened today grows hottest and thickest, those lines that have developed every possible angle of their business along the transportation avenues the steamship and railroad companies have opened through years of traffic experience, will find themselves best equipped to survive the conflict.

In a year or two years, it will no longer be "shall we fly or go overland?" but "I always fly on such-and-such a line"—permanent clienteles built up through an appreciation of ultimate service possible—clienteles sold on certain pilots, certain ships and certain lines as strongly as passengers today are sold on our great railroad expresses and our great liners.

That is what "railroading" stands for in its fullest sense—"getting the traffic through as the traffic demands to go"—and that is what the airlines must come to, for it is only those lines that are "railroaded" thoroughly that will survive the next two years of development.

### THE FLYING GENERAL

(Continued from page 51)

an anchor, he could not land on the water again. The only alternative was to fly to Pictou despite the fog. This was accomplished by flying directly over a small spur line railroad at an altitude of between 25 and 50 feet. In this way the land hop was accomplished, and his first interest upon arriving at Pictou was for the other ship. He gave a sigh of relief when he learned that Captain Eaker had landed safely about 20 miles away.

When on a cross-country flight or an expedition of any kind, the General is a real fellow, kicking in and doing his share of the work in the servicing and maintenance of the plane. General Fechet truly deserves the title of "The Flying General."

### AERONAUTIC RESEARCH

(Continued from page 53)

reactions at constant pressure has been carried out by means of a constant pressure bomb. The bomb consists simply of a soap bubble filled with an explosive gaseous mixture of known composition, with a spark-gap at its center. The motion of the flame is photographically recorded on a film moving at a known speed, the optical system being so arranged that the light reaching the film is confined to a narrow horizontal strip across the center of the bubble, while the film moves in a vertical direction. The record permits the determination of the flame velocity in space and the volume change at any instant.

The use of the constant pressure bomb greatly simplifies the analysis of the explosive reaction, because under constant pressure the processes of the reaction become automatically uniform. The measurements are not necessarily made at atmospheric pressure. By placing the bomb within a large closed container provided with suitable windows, records have been obtained for pressures ranging from below atmospheric to 190 cm. of mercury.

Studies of known mixtures (1) carbon monoxide and methane with oxygen, and (2) carbon monoxide and hydrogen with oxygen, have shown that the reaction velocity is proportional to the product of the concentrations of the reacting gases. It thus becomes possible to predict the flame velocity of any composite fuel made of these gases for any mixture ratio of fuel and oxygen that will ignite. The effect of the presence of an inert gas on the reaction rate may be accounted for by an additive term proportional to the concentration of the inert gas, the constant of proportionality apparently depending upon the molecular heat of the gas.

(Paper submitted to the International Civil Aeronautics Conference, Washington, D. C., December 12-14, 1928.)



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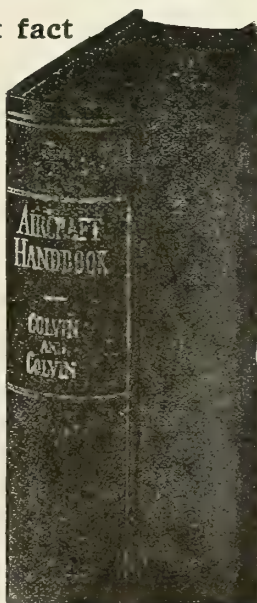
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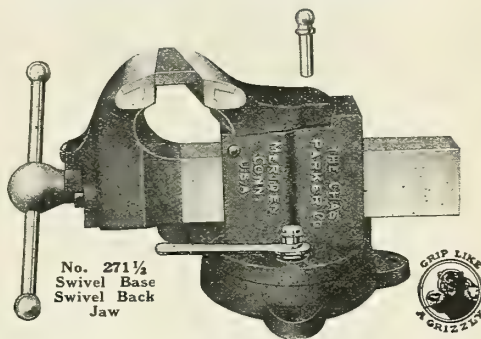
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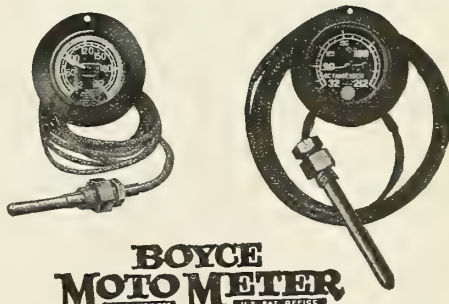


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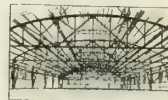
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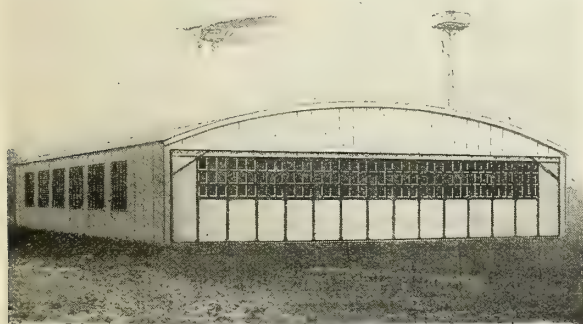
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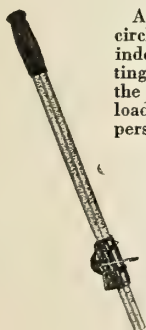
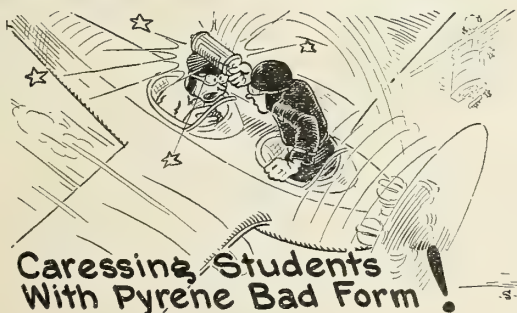
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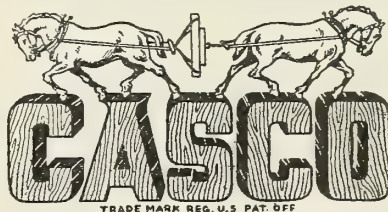
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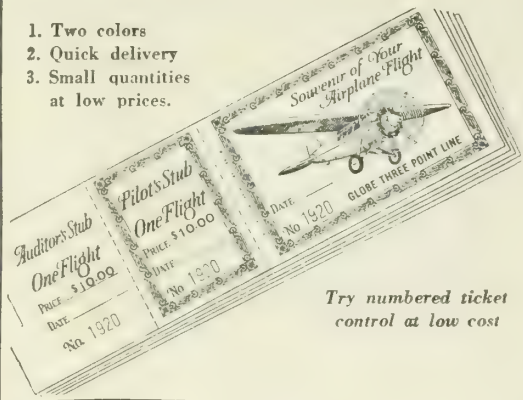
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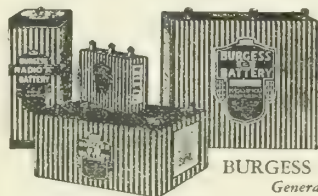
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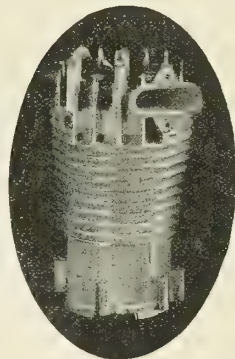
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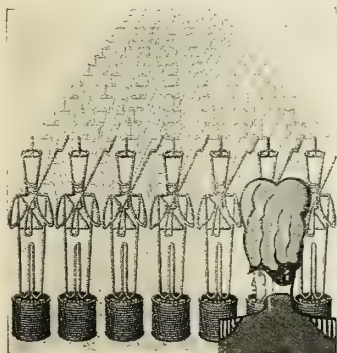
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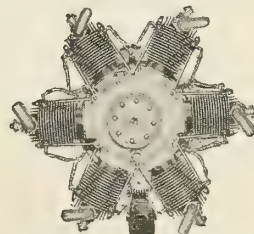
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# TEX RANKIN PASSES JUDGEMENT

## On Advertising In The Flying School Section Of Aero Digest

A recent letter from Tex Rankin to AERO DIGEST reads, in part, as follows . . . . "we have always been very well pleased with the results obtained from advertising in AERO DIGEST. Upon checking over our inquiries we find that we receive twice as many sales for each dollar spent in AERO DIGEST as compared with an equal amount spent in any other magazine . . . . (Signed) Tex Rankin."

Tex Rankin is head of the Rankin Flying School of Portland, Oregon, one of the most

successful and active schools on the west coast. The material contained in his letter was the result of an investigation into what returns he was getting for the money he spent in advertising.

This is our point—inquiries don't mean a thing unless they are productive of sales. Check your advertising then, not for the number of inquiries, but for the number of sales. You will find, as Tex Rankin has found, that advertising in AERO DIGEST will bring more actual sales than any other source.

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**WILLING WORKER:** Wants flying instruction. Am high school graduate, also graduate of Aviation Institute of U. S. A. Will consider any offer. Box No. 5, Martin, Ga.

**WANTED:** Opportunity to learn airplane construction, design, thru employment in training school or going factory. Prefer drafting and designing department. Ability to enter unfamiliar field and within six years receive promotions thru factory operations, sales and to superintendency of fixture factory offered for your approval. 26, best references. Details by request. What have you? AERO DIGEST, Box 783.

**FOR SALE:** One Russell Lobe Cotton Parachute, back type. Cost \$250. Jumped ten times on exhibition. First \$100 takes it. Davis Aircraft Corp., Richmond, Ind.

**WANTED:** To lease for thirty days a tri-motored Ford, preferably with privilege of purchase at the end of one month. Russell D. Carter, 5017 Woodland Avenue, Kansas City, Missouri.

**WANTED:** Job by spring, as pilot and mechanic, any place out of States. 5 years Air Service Mechanic, over 400 hours commercial flying. Passenger receipts, \$2,300 last year. Furnish cash bond. Single, age 27. Address AERO DIGEST, Box 781.

(Continued on next page)



## CLASSIFIED ADVERTISEMENTS

(Continued from preceding page)

**FOR SALE:** Liberty engined airplane (Heinkel) practically new. Cruising speed with pay load (1000 lbs.), 100 m.p.h. Fitted with dual control. Ideal for photographic and special work. Equipped for night flying. Quick take-off. Slow landing speed. Address G. P. Montague, Treas., 27 West 44th Street, New York City.

**STINSON BIPLANE, J-4B** Wright Whirlwind motor, 200 hours. Recently overhauled by Stout Aircraft Corp., Detroit. Ship and motor in perfect flying condition. \$5,000 delivered. Chattanooga Airways, Ltd., care Lancaster Bros., 400 Broad St., Chattanooga, Tenn.

**AIRCRAFT YEAR BOOKS WANTED:** Until April 15th, for clean copies in good condition, suitable for library use, the following prices will be paid for a limited number of copies: 1921-1923 issues, \$4; 1928 issue, \$3.50. AERO DIGEST, Box 786.

**FOR SALE:** Waco 9, like new, OX-5 motor, Hartzell propeller, dual control. Turns up 1400 r.p.m. on ground. Ready to fly, \$1400 cash. Michael Gondyk, 354-21st St., Brooklyn, N. Y. Phone South 10377.

**WILL FLY** for private party for privilege of more flying time; also want to buy used plane cheap. AERO DIGEST, Box 787.

**NEW AVIATION MAP:** Complete map of United States showing landing fields and airports, accurate and up-to-date. Each \$1.50, 5 for \$6. Special maps made to order. AIRLINE MAP COMPANY, 3207 Mt. Pleasant St., Washington, D. C.

**FOR SALE:** Hisso 220 motors and parts. Complete new motors, \$400; parts reasonably priced. American Eagle Aircraft Corporation, Fairfax Airport, Kansas City, Kansas.

**TRANSPORT PILOT:** Over 1600 hours, experience on tri-motor planes. Desires position. Go anywhere. Please give full details in your first letter. AERO DIGEST, Box 782.

**INVENTIONS WANTED:** Patented, unpatented. If you have an idea for sale write HARTLEY, Box 928, Bangor, Maine.

**FOR SALE:** Used American Eagle Airplane, 1927 model, with OX5 motor. Excellent condition. Price, \$1900; less motor, \$1500. AMERICAN EAGLE AIRCRAFT CORPORATION, Kansas City, Mo.

**PARACHUTES,** new and used, for ships of all types, rope ladders for stunt men, etc. Specify weight. Established 1903. THOMPSON BROS. BALLOON CO., Aurora, Ill.

**YOUNG MAN:** Eighteen, desires work at airport, airplane factory or as an apprentice mechanic. Felix Pankiewicz, Jr., 46 Golden St., Norwich, Conn.

**WANTED:** Two 18 x 3 wheels with tires and tubes, good condition. State price. Write Box 174, Calumet, Minn.

**FOR SALE:** Eaglerock plane, 80 hours on motor, kept in hangar, \$2400. Address P. O. Box 232, Flat Rock, Wayne County, Mich. Phone 15 Flat Rock.

**FOR SALE:** Newly completed special built Lincoln Sport Plane. Specially built throughout for Junior Transcontinental air race. Real Bargain. J. C. Abrahamsen, 1411 Bay Street, Eureka, Calif.

**SWALLOW, OX-5,** three place biplane. Fully equipped, ready to fly. Less than 200 hours. 80 hours since last overhauled. In excellent shape for commercial or pleasure service. Has received best of care—serviced and hangared at large airport since purchase. AERO DIGEST, Box 729.

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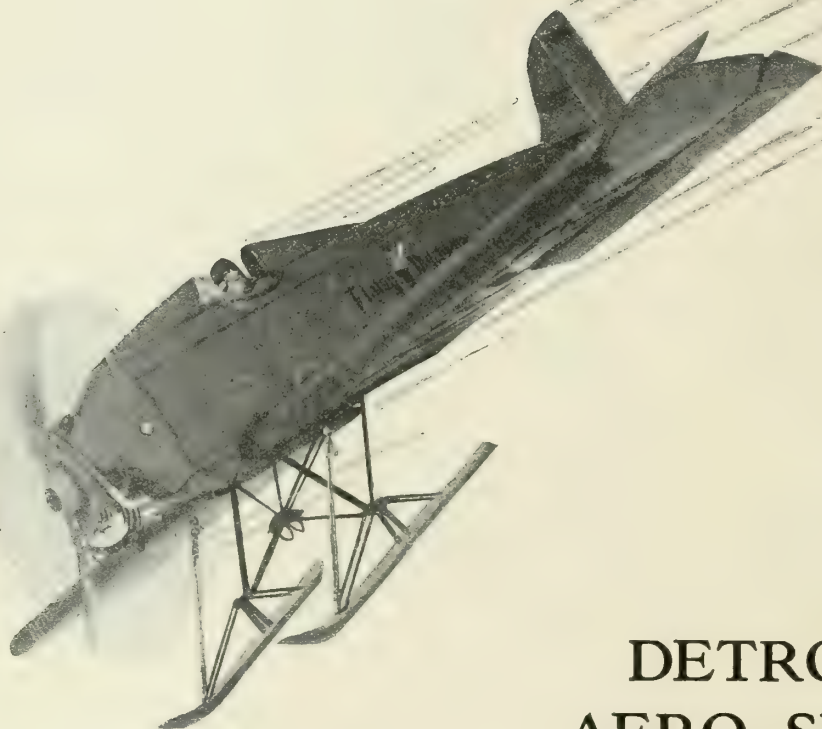
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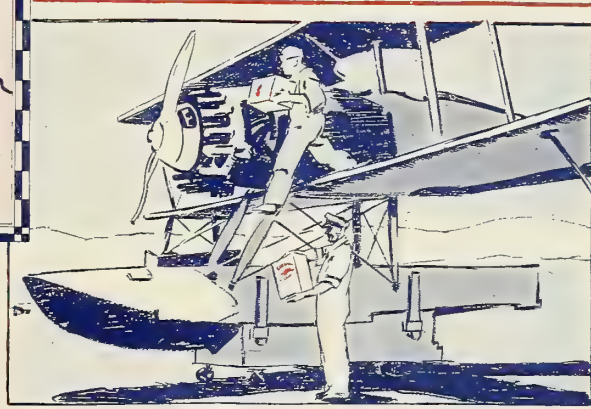
AND WISH YOU  
A PLEASANT AND  
PROFITABLE WEEK

SZEKELY AIRCRAFT & ENGINE CO.  
HOLLAND, MICHIGAN

# Peru relies on Mobiloil in conquest of the Andes



Keystone Seaplanes, powered with Wright-Whirlwinds are used along the Ucayli River in the Lima-to-Iquitos service. The picture shows one of these powerful planes being supplied with Gargoyle Mobiloil.



**V**AST regions in South America, fabulously rich in natural resources but hitherto practically inaccessible, are now being exploited through the rapid development of commercial aviation.

The Peruvian Government was among the first to take advantage of the immense opportunity offered by this new means of transportation. Regular air lines now connect Lima, on the sea coast, with distant inland points lying beyond the towering Andes and across hundreds of miles of trackless forests.

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